

American Journal of Orthodontics and Oral Surgery

FOUNDED IN 1915

CONTENTS

ORTHODONTICS

| | |
|---|-----|
| The Axial Inclination of the Mandibular Incisors. Herbert I. Margolis, D.M.D., Boston, Mass. | 571 |
| A Case of Hereditary Mesioclusion Complicated by Endocrin Dysfunction. Brooks Bell, D.D.S., F.I.C.D., Dallas, Texas.... | 595 |
| Chrome Alloy in the Labio-Lingual Technique. William A. Giblin, B.S., D.D.S., Montclair, N. J. | 602 |
| Editorial. At the Crossroads..... | 610 |
| Honor Roll of A.A.O. Members Serving in the Armed Forces | 614 |
| Orthodontic Abstracts and Reviews..... | 616 |
| News and Notes..... | 621 |
| Officers of Orthodontic Societies..... | 622 |

ORAL SURGERY

| | |
|--|-----|
| The Clinic of the Dental Department of the Massachusetts General Hospital and the Department of Oral Surgery, Harvard School of Dental Medicine. Kurt H. Thoma, D.M.D., and Frederick H. Kalil, D.M.D., Boston, Mass. | 513 |
| I. Developmental Anomalies | 513 |
| II. Blood Dyscrasias | 517 |
| III. Infection of the Fascial Spaces of the Neck | 520 |
| IV. Fractures of the Jaws..... | 523 |
| V. Osteomyelitis of the Jaws..... | 533 |
| VI. Ankylosis of the Jaw..... | 550 |
| VII. Tumors and Cysts..... | 559 |
| VIII. Diseases of the Salivary Glands | 578 |
| IX. Surgical Prosthesis | 584 |
| Editorial. The Publication of Oral Surgical Case Reports From Teaching Hospitals | 589 |

Published by THE C. V. MOSBY COMPANY, St. Louis, U. S. A.

COPYRIGHT 1943 BY THE C. V. MOSBY COMPANY

NOV 27 1943

©C18 609020



WON and HELD

BY

WILLINGNESS TO SERVE

AND

ABILITY TO SERVE

A quarter of a century ago, Dee & Co. gave to the practice of Orthodontics DEEORTHO Band Material . . . a precious metal specialty featuring:

Inherent tensile strength combined with adaptability for precision fit.

Ease of contouring for perfect re-fitting, unsoldering, and re-soldering without danger of burning.

Permanent cleanliness with freedom from oxidation . . . even under flame or heat.

Other technical contributions like the Stiffness Test and the Dee HEATREAT Unit indicate that Dee & Co. accepts the responsibility of leadership to continue

serving, not merely well, but better

GENERAL OFFICES
AND PLANT
1900 W. KINZIE ST.

T H O M A S J.
DEE & CO.
Precious Metals
CHICAGO

DOWNTOWN OLD GOLD
AND SALES OFFICE
55 E. WASHINGTON ST.

Vol. 29, No. 10, October, 1943. American Journal of Orthodontics and Oral Surgery is published Monthly by The C. V. Mosby Company, 3525 Pine Blvd., St. Louis 3, Mo. Subscription Price: United States, Its Possessions, Pan-American Countries, \$8.50; Canada, \$10.00 (Canadian Currency); Foreign, \$9.50. Entered as Second-class Matter at Post Office at St. Louis, Mo., under Act of March 3, 1879. Printed in the U. S. A.

OCTOBER, 1943

Oral Surgery

including

Oral Medicine, Pathology, Diagnosis, and Anesthesia

EDITOR-IN-CHIEF

KURT H. THOMA

ASSOCIATE EDITORS

Alfred J. Asgis
Hermann Becks

Le Roy M. Ennis
George J. Fink

Lieut. Col. Roy A. Stout

Lt. Col. Thomas J. Cook, U. S. A., Foreign Correspondent

CONSULTING EDITORS

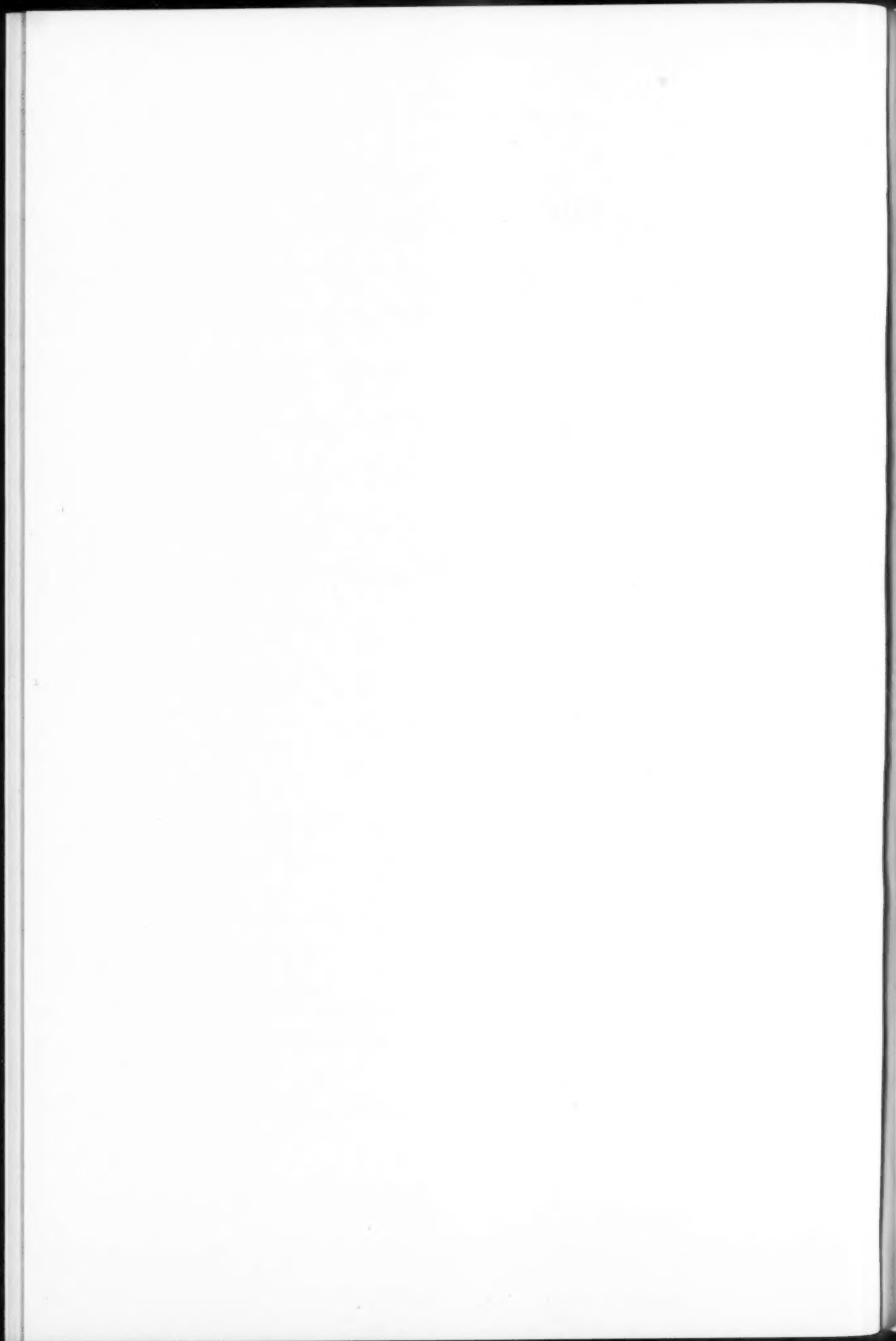
Robert H. Ivy
Varaztad H. Kazanjian

John W. Kemper
Le Roy A. Schall

ABSTRACT DEPARTMENT

David Weisberger

Office of the Editor: 53 Bay State Road, Boston
Published by The C. V. Mosby Company, St. Louis



Massachusetts General Hospital Number

THE CLINIC OF THE DENTAL DEPARTMENT OF THE MASSACHUSETTS GENERAL HOSPITAL AND THE DEPARTMENT OF ORAL SURGERY, HARVARD SCHOOL OF DENTAL MEDICINE

KURT H. THOMA, D.M.D.,* AND FREDERICK H. KALIL, D.M.D.,† BOSTON, MASS.

THE case reports which follow have been selected from the records of patients treated in the Massachusetts General Hospital during the first six months of 1943. An attempt has been made to give an over-all picture of the problems which arise and the methods of treatment which are employed at this hospital, and to present clinical information of value to the dentist and oral surgeon, whether he is a member of a hospital staff or concerned only with private practice.

Most of the cases included were discussed in the dental conferences held at the Hospital, and the opinions expressed there by members of the staff have frequently been incorporated in the discussion which follow the case histories. We should like to acknowledge here the valuable assistance of the Departments of Radiology and Pathology in going over the manuscript before publication.

I. DEVELOPMENTAL ANOMALIES

Case 1

Cleidocranial Dysostosis With Dental Anomalies

A. S. (No. 409464), a 22-year-old woman, was admitted to the Hospital on June 22, 1943, for excision of a cyst, extraction of supernumerary teeth, and general study.

The patient had a long history of dental anomalies. There were many deciduous teeth still present (Fig. 1), and she had an abnormal number of permanent teeth. In the anterior region there were six unerupted incisors, in both the upper and lower jaw. In addition, there was a marked swelling in the upper jaw under the lip, which, on x-ray examination, proved to be a cyst (Figs. 2 and 3). In the premolar region four premolars were found unerupted on all four sides. The first permanent molars had erupted, the second molars were unerupted in the mandible, and cysts had developed from both impacted third molars in the lower jaw (Figs. 4 and 5).

The patient had been under treatment for scoliosis for some time. Her health had been fairly good. The family history was noncontributory. She was

*Chief of Dental Department, Massachusetts General Hospital; Professor of Oral Surgery, Harvard University.

†Senior House Officer, Dental Department, Massachusetts General Hospital. Now First Lieutenant (D.C.), U. S. Army.

acutely sensitive and refused complete physical examination. There was no evidence of heart or kidney disease or of recent upper respiratory infection.

Since a systemic involvement might account for the dental abnormalities, it seemed wise to make a complete physical study prior to local treatment. Dr. Joseph C. Aub was consulted regarding the possibility of ectodermal hyperplasia. His report follows:

"This is a most interesting deviation from the normal in growth. My present guess is that this is a widespread bone lesion causing poor growth of extremities as well as scoliosis. The hair growth seems excessive and very coarse, and the nails are not normal. She has an enormous number of teeth, of which many are unerupted. I think she ought to be carefully studied."

Chemical blood studies showed the cholesterol to be 82 mg. per 100 c.c.; the calcium, 9.7 mg.; the phosphorus, 2 mg.; and the phosphatase, 1.6 units.



Fig. 1.—Oral condition in cleidocranial dysostosis in a woman aged 22 years. All anterior teeth are deciduous.

Roentgenologic examination was made of the skull, the spine, the femora, the knees, and the hands. The report follows:

"The sutures of the skull are rather wide for a person of this age and there is thinning in the area where the fontanels are to be expected; however, the fontanels appear to be closed. There are numerous unerupted teeth. The thoracic spine shows marked scoliosis. The lower cervical and upper thoracic vertebrae show incomplete fusion of the laminae, as does the fifth lumbar vertebra. The scapular halves of the clavicles are absent and there is incomplete development of the glenoid portion of the scapulae as well as the acromion processes. The femoral necks are straighter than usual, producing coxa vara deformity, probably of congenital origin. The pubic symphysis is markedly widened. The epiphyses of the knees are closed and all the bones are rather slender. There is not definite structural abnormality. The terminal phalanges

of the fifth fingers are rather long and tapering. All of these findings are consistent with cleidocranial dysostosis."

On June 23, the following operation was performed under pentothal sodium anesthesia (a total of 1.7 Gm. intravenously): First, the cyst in the anterior part of the maxilla was excised together with the four deciduous incisors. This brought into view the six permanent maxillary incisors. Of these, the two medial incisors were found to have extremely broad cutting surfaces, resembling double teeth. Because of this deformity, they were removed and the wound was closed with sutures. Second, the deciduous maxillary canines were extracted,



Fig. 2.

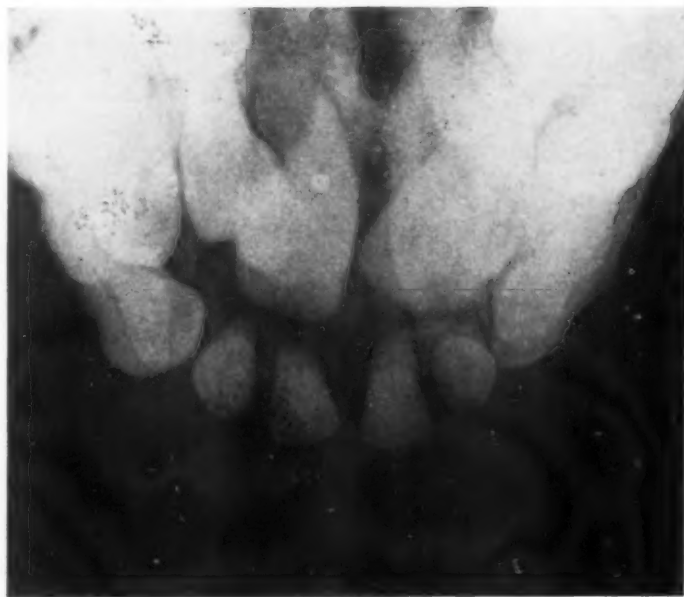


Fig. 3.

Figs. 2 and 3.—X-ray films of anterior part of maxilla, showing supernumerary unerupted incisors and cyst.

and the bone overlying the permanent teeth was removed. Third, an incision was made along the gingival margin of the mandibular incisors, a mucoperiosteal flap was prepared, and bone was removed to expose the teeth. The medial incisors were chosen as those to be removed, since the other four seemed in good



Fig. 4.

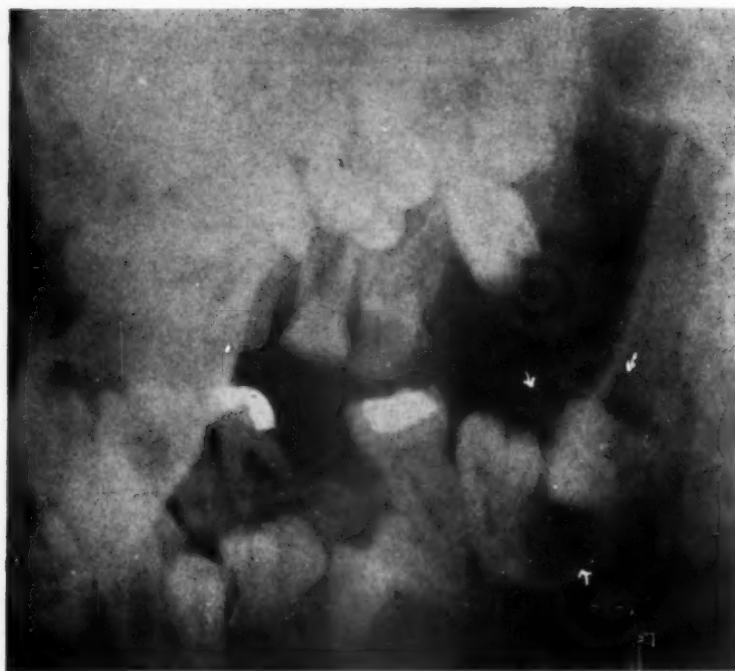


Fig. 5.

Figs. 4 and 5.—Lateral jaw films showing supernumerary premolars and unerupted second and third molars with cyst formation.

position to erupt. The flap was returned and the incision closed by sutures. Fourth, the mandibular third molars were excised on each side in order to free the second molars. Sulfanilamide powder (a total of 1 Gm.) was sprayed into the wound and gauze packs were placed between the jaws to arrest hemorrhage.

It was hoped that the removal of these impinging supernumerary teeth would allow the others to erupt so that a normal complement of erupted teeth might be obtained.

Following the operation, a further consultation was requested with Dr. Aub, who made the following report:

"Now it is clear that this is so-called cleidocranial dysostosis, associated with supernumerary teeth which failed to erupt. This is a congenital abnormality with poor osteoblasts, indicated by the phosphatase level, which is unusually low. The low phosphorus is also important in the deposit of calcium and phosphorus in the bones. I do not think there is anything which will completely straighten out the congenital bone-cell deficiency. I would advise ample phosphorus in the diet with about 20 drops of navitol daily by mouth. Thyroid might help the eruption of the teeth. The calcium, phosphorus, and phosphatase levels should be checked at a later date."

After discharge, the patient was seen at the office to observe the result of the treatment. After two months, the canines were found to be partially erupted in the upper jaw.

DISCUSSION

This patient, having many supernumerary teeth, exuberant hair growth, and rapid growth of the fingernails, was thought at first to have overproduction of structure derived from ectoderm, the opposite of ectodermal dysplasia, which is associated with anodontia, scant hair, and absence of sweat glands. The discovery of cleidocranial dysostosis explains the lack of erupting power, as unerupted teeth commonly accompany this skeletal disease.

II. BLOOD DYSCRASIAS

Case 2

Idiopathic Thrombocytopenic Purpura

F. P. (No. 401653), a 24-year-old man, was seen on April 24, 1943, complaining of bleeding from the mouth, a red rash on the legs, and bloody urine.

Two weeks previously, the patient had noticed a red rash on the legs, which did not itch. Twelve days later the gums around the necks of the teeth became swollen and bled profusely. His physician had the blood examined. He concluded that the condition was purpura hemorrhagica and referred the patient to the Leary Laboratory for a blood study. The report was as follows: Photo-hemoglobin, 13.8 Gm. per 100 c.c.; red cells, 4,049,000; white cells, 10,400 with 74 per cent polymorphonuclear leucocytes, 1 per cent large lymphocytes, 14 per cent small lymphocytes, and 11 per cent monocytes. Platelets were abundant. The bleeding time was 3 minutes and the clotting time was 45 minutes. The opinion was expressed that the patient did not have purpura hemorrhagica but a streptococcal infection. Because of the soreness of the mouth and the bleeding from the gingivae, complete oral examination was advised.

On examination, the oral cavity presented generalized swelling of the gingivae, with a profuse flow of blood from around the gingival crevices. There were many blebs and a large area of ecchymosis on the palate (Fig. 7). There were many petechiae on the legs and arms, and the patient stated that he had been suffering from a backache for several days and that his urine had become bright red a few days before.

A tentative diagnosis of purpura was made, and the patient was admitted to the Hospital for complete study.

It was found that the onset of the disease had been sudden, the symptoms resulting from no apparent cause. There was no history of exposure to benzene, and the diet had always included large amounts of fresh fruits and vegetables. Although the patient had noticed free bleeding from minor cuts, he had never required medical attention for this condition. The family history revealed no bleeding tendency.

Physical examination showed a patient in acute distress, with considerable ecchymosis and pin-point hemorrhages around the eyes (Fig. 6), arms, back, and legs. The spleen was not palpable. The temperature was 101.5° F., the pulse rate 110, and the respiratory rate 22.

The hemoglobin and red-cell and white-cell counts were normal. The bleeding time was 18 minutes. The clotting time, tested by the five-tube method, was as follows: first tube, 20 minutes; second tube, 30 minutes; third, fourth, and fifth tubes, 45 minutes. There was no incubated clot retraction in twenty-four hours. Very few platelets were seen in the first blood specimen. The urine was blood red and had a specific gravity of 1.026. The tourniquet (Rumpel-Leede) test showed forty petechiae per square inch five minutes after the administration of 90 to 100 mg. of mercury.

Several diagnoses were considered at this time, including scurvy, acute leucemia, and idiopathic thrombocytopenic purpura.

The patient was placed on a soft-solid diet and given frequent hydrogen peroxide mouth washes. A solution of glucose, salt, and large amounts of vitamin C and vitamin K was administered intravenously. He was seen by Dr. Wyman Richardson, who made the following report:

"I feel sure that this patient has idiopathic thrombocytopenic purpura. The history is suggestive. Examination shows asymmetrical purpura. The blood smear shows very few platelets (I saw only two in the whole preparation). There is no clot retraction. The bleeding time is 18 minutes. There is no evidence of leucemia. I would advise splenectomy without further delay. The operation should be immediately preceded by a transfusion of fresh blood."

A splenectomy was performed the following day by Dr. Arthur Allen. A smear taken immediately after the operation showed very few platelets. The following day the number of platelets had increased greatly, and on the third postoperative day there were approximately 400,000 per cubic centimeter. The Rumpel-Leede test was negative three days after the operation. The bleeding from the mouth diminished rapidly and finally ceased four days after removal of the spleen. The hematuria and the purpuric spots disappeared within ten days. The patient was kept in the hospital for three weeks and was then discharged as cured.

The pathologic diagnosis was idiopathic thrombocytopenic purpura.



Fig. 6.—Petechiae in idiopathic thrombocytopenic purpura.



Fig. 7.—Oral condition in idiopathic thrombocytopenic purpura. Arrows point to blebs on the palatal mucosa.

DISCUSSION

This is another case in which the oral symptoms were the outstanding feature in a generalized disease. Although signs of purpura were plainly visible, the patient sought treatment principally for the condition of his mouth. Many

patients with blood dyscrasias complain of oral disease without realizing that they are suffering from a grave malady. The dentist and oral surgeon should therefore be alert at all times in order to recognize important underlying factors in cases of hemorrhage from the mouth, oral infections, and hypertrophies of the mucosa.

III. INFECTION OF THE FASCIAL SPACES OF THE NECK

Case 3

Abscess of the Pharyngomaxillary Space of Odontogenic Origin

L. K. (No. 404624), a 21-year-old girl, was referred to the Hospital on May 29, 1943, by the Boston Lying-in Hospital, for continuance of treatment of an infection of the jaw.

On May 12, the patient first complained of pain and swelling in the lower right jaw. During the next four days the condition became worse, and she was unable to open her jaw more than 2 cm. Chills and fever developed on May 16, and sulfadiazine therapy was instituted.

On May 17, the patient was admitted to the Lying-in Hospital in active labor. On physical examination, the skin was found to be feverish and dry. The right lower jaw and cheek were extremely tender, swollen, and red. The area of induration extended back to the ear, up to the infraorbital line, and down into the neck. The anterior cervical and submaxillary nodes were enlarged and tender. It was impossible to examine the infected tooth at this time, but the adjoining soft tissues, which could be seen, were swollen and exuded foul green pus. The case was considered one of pericoronal infection. The temperature was 98° F., the pulse rate 100, and the respiratory rate 30. Three hours after admission she was delivered of a female infant weighing 6 pounds, 12½ ounces, who died the following day of intracranial hemorrhage.

On May 18, the patient again had a chill and the temperature rose to 107° F. The white-cell count was 30,200. Incision and drainage were advised.

At operation (by Dr. Harold A. Carnes), under intravenous pentothal sodium anesthesia, an incision approximately 2.5 cm. in length was made anterior to and below the angle of the right mandible. A curved hemostat was inserted in the submaxillary triangle, but no pus was found. The hemostat was then passed under the angle and into the pharyngomaxillary space, and a large quantity of foul-smelling pus was obtained. A cigarette drain was inserted.

There was profuse drainage from the incision. Sulfadiazine therapy was continued, and flaxseed poultices and intraoral hot saline washes were instituted. The day after the operation, the temperature dropped to 99° F. and the white-cell count, to 22,400. The pain was relieved. After the infection subsided, the lower right third molar was extracted. Nine days later, after an uneventful obstetrical recovery, the patient was transferred to the Massachusetts General Hospital.

On arrival at this hospital, the patient "felt fine" and had no complaints. There was moderate indurated swelling of the right jaw extending upward toward the parotid region and downward into the submaxillary space. There was

an incision approximately 2.5 cm. long beneath the angle of the left mandible. A rubber-dam drain was in position, and there was profuse discharge of watery yellowish pus. The patient could open her mouth to almost normal width. Examination of the extraction socket showed it to be healing, and there was no discharge from the socket. The right lateral pharyngeal wall was swollen and tender to touch. The skin was very damp and hot. The patient was perspiring profusely. The temperature on admission was 103° F., the pulse rate 100, and the respiratory rate 40.

The red-cell count was 4,100,000, and the hemoglobin 70 per cent. The number of platelets was slightly above normal. The white-cell count was 15,000 with 84 per cent polymorphonuclear leucocytes.

Bacteriological examination of the draining pus revealed *Staphylococcus aureus* in abundance, and a few nonhemolytic streptococci. A blood culture was also positive for *Staph. aureus*.

Roentgenologic examination of the chest showed no evidence of infarcts or pneumonia.

Sulfadiazine therapy was instituted on the day of entry, and intravenous injections of vitamin C and hykinone were administered. The patient was seen by Dr. Moses H. Lurie, who reported as follows:

"In my opinion this patient has had a pterygomaxillary fossa abscess which was partially drained by the incision in the submaxillary region. She now has inadequate drainage of the region and also has a definitely involved right jugular vein. The right jugular should be tied off and the incision of the neck prolonged posteriorly to drain the pterygomaxillary fossa."

On June 1, the urine became loaded with red blood cells, and sulfadiazine was therefore discontinued. On June 3, the temperature rose to 107° F. The patient complained of pain in the right side of the chest, and emergency x-ray examination showed an infarct at the base of the right lung. She was rushed to the operating room for incision and drainage of the abscess.

The operation was performed by the surgical department. Under nitrous oxide-oxygen-ether anesthesia, a longitudinal incision was made over the lower border of the sternomastoid muscle. As soon as dissection was begun in the deeper tissues of the neck, it was obvious that lymphangitis and cellulitis had extended down to this level, although there was no free pus. The tissue had the appearance of permeation of organisms through tissue spaces and lymphatics without abscess formation.

The sternal head of the sternomastoid muscle was severed so as to allow a low exposure of the jugular vein. The carotid sheath was intimately adherent to the vein wall and surrounding structures. It was opened, and, with some difficulty, separated from the vein. There was no natural cleavage plane around the vein, which was then ligated with No. 0 chromatinized catgut. A very small drain was placed in the wound, which was closed with silk sutures.

The wound below the jaw was then exposed and enlarged by about 5 or 6 cm. Digital exploration revealed that the floor of this cavity was formed by the side wall of the mandible, which was completely denuded. The pus pocket extended back to the carotid sheath, and in this region there was no further extension upward or backward that could be demonstrated digitally, with instru-

ments, or under direct vision. Likewise, no pocket could be found under the floor of the mouth. However, the neck wound communicated directly down around the carotid sheath with the wound made for the vein ligation. Thus the wider opening in the neck produced more adequate drainage but did not open any new abscess. The wound was packed and the patient was returned to the ward, where she was given a transfusion of 150 c.c. of fresh whole blood.

After the operation, the patient improved remarkably. By June 7, the temperature was normal and the white-cell count was 11,000. Drainage continued to be profuse, and the swelling persisted, although it receded considerably. On June 13, the patient was discharged, to be followed in the Outpatient Department.



Fig. 8.—Incision with healing fistula from pharyngomaxillary abscess. Note scar where jugular vein was ligated.

On July 28, there was still drainage from the wound (Fig. 8), although it was not so profuse as it had been. The peritonsillar swelling had disappeared, and the patient felt well and had gained weight. At the time of writing, she is still under treatment.

DISCUSSION

This patient later stated that she had seen her dentist previous to this episode and that he found a pericoronar infection around the right lower third molar. He was afraid to remove the tooth because she was pregnant. In retrospect, it is evident that the removal of this tooth could not have caused more trouble than occurred, and, with chemotherapy, the chance of complications could have been greatly lessened. Phlebitis of the jugular vein, although not common, is a complication that must be borne in mind in all such infections. In cases with marked trismus of the elevator muscles of the jaw, abscesses of the

pharyngomaxillary space (so-called "parapharyngeal" abscesses) are difficult to recognize because the patient cannot open her mouth to allow inspection of the throat. When no pus is found on opening the submaxillary space, it should always be remembered that the latter opens into the pharyngomaxillary space, which can be reached by probing or by inserting a curved hemostat into it. After a pharyngomaxillary abscess is incised, a deep drain should be inserted to prevent the wound from closing. In this case, the complications which arose were probably due to the lowered resistance of the patient.

IV. FRACTURES OF THE JAWS

Case 4

Horizontal Fracture of the Maxilla

P. S. (No. 407542), a 27-year-old man, was referred to the Hospital on June 21, 1943, for treatment of what appeared to be a fracture of the maxilla.

Thirteen days previously, the patient's automobile crashed into a tree and he was thrown forward, his face striking the windshield. He did not lose consciousness, nor did he suffer headaches, disturbance of vision, or stiffness of the neck. Eleven days after the accident, however, he noticed that his teeth did not come together properly.

The patient had had no serious illnesses or previous injuries. The family history was also noncontributory.



FIG. 9.—Open bite caused by maxillary fracture.

Physical examination showed a well-developed and well-nourished young man in mild distress. There was ecchymosis about both eyes, but no significant swelling. There were minor lacerations and contusions over the left shoulder and both knees. Most of the upper and lower teeth were present, but moderately carious. The maxilla was retracted so that the lower jaw protruded (Fig. 9). When the maxilla was grasped with the fingers, slight lateral and forward motion could be produced, giving evidence of a fracture with considerable fibrous union. The temperature was 99° F., the pulse rate 60, and the respiratory rate 20. The white-cell count was 8,400. Urinalysis was negative.

X-ray films taken in the posteroanterior view revealed fractures through both right and left infraorbital ridges (Fig. 10). The diagnosis was horizontal fracture of the maxilla.

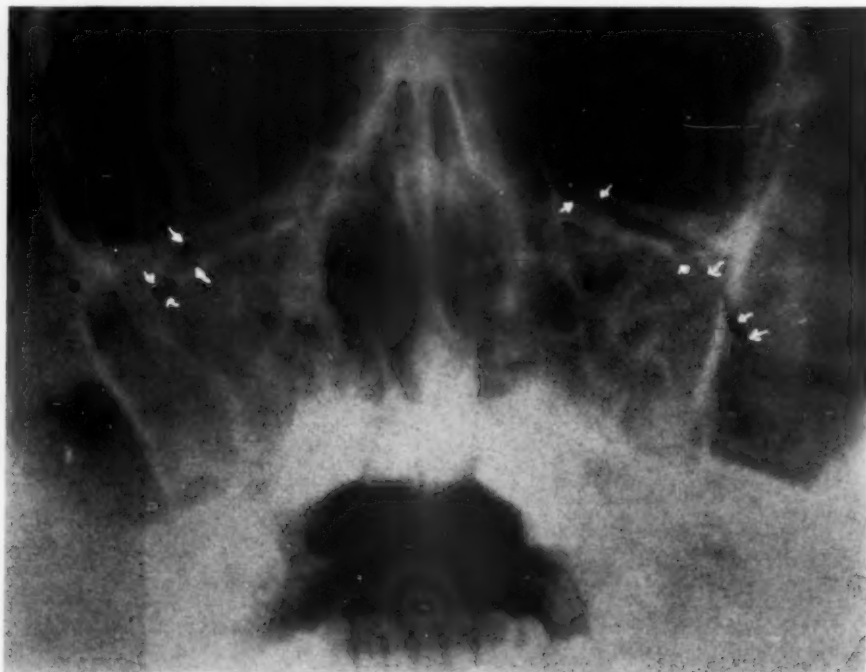


Fig. 10.—Posteroanterior x-ray films of face showing fracture of maxilla.



Fig. 11.—Jelenko splints with elastics to close bite and bring maxilla forward.

Reduction under general anesthesia was advised. The patient was admitted to the main hospital and given routine preoperative treatment, including $1\frac{1}{2}$ grains of nembutal the night before the operation, and $\frac{1}{6}$ grain of morphine and $\frac{1}{150}$ grain of atropine subcutaneously one hour before the operation.

Under intravenous pentothal sodium anesthesia, Jelenko arch-wire splints were wired to the upper and lower teeth, and, as reduction by manipulation was

unsuccessful, intermaxillary elastic traction was applied by means of strong elastics. Within thirty-six hours, the maxilla was brought down and forward, due to the direction of the force applied by the dark elastic bands shown in Fig. 11. Additional elastic traction was then placed on the anterior teeth by means of the white elastics to close the bite and further stabilize the jaw in its corrected position (Fig. 12). The patient was discharged on the second postoperative day, to be followed in the Outpatient Department. Six weeks after the operation, the elastics and splints were removed. There was clinical evidence of complete bony union and good occlusion.



Fig. 12.—Postoperative x-ray showing use of Jelenko splints.

DISCUSSION

In many horizontal fractures of the maxilla, open-bite is found due to telescoping and retrusion of the maxilla caused by contraction and spasm of the external pterygoid muscles. Fibrous union soon occurs, and a fracture two or three weeks old generally cannot be reduced by manipulation. As in this case, the application of traction by means of intermaxillary elastics gives good results in twenty-four to forty-eight hours.

Case 5

Bilateral Fracture of the Mandible

R. W. (No. 405632), a 26-year-old man, was seen in the Dental Clinic on May 23, 1943, with a chief complaint of swelling of the jaw and inability to open the mouth.

About forty hours before, the patient was assaulted, knocked down, and kicked in the face several times. There was bleeding from lacerations about the right eye, from the nose, and from between two teeth on the lower right side.



Fig. 13.—Compound fracture of right side of mandible, involving mesial root of first molar.



Fig. 14.—Fracture of left side of mandible, through unerupted third molar.

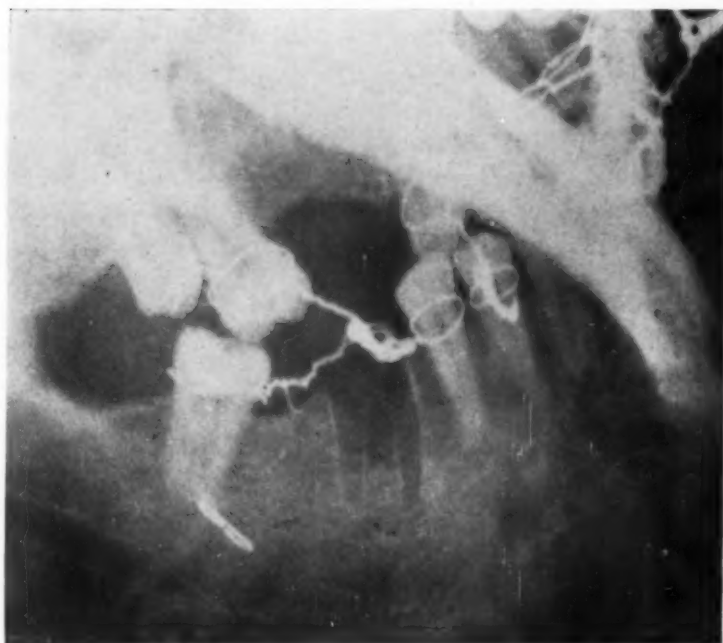


Fig. 15.—X-ray film of right jaw. The root has been removed and intermaxillary ligation applied.



Fig. 16.—X-ray film of left jaw, showing unerupted third molar removed without disturbance of allinement of fragments, and intermaxillary ligation applied.

He did not become unconscious. His right eye became swollen and discolored shortly after the assault. The next day he noticed that his face appeared asymmetrical. The jaw motion became limited and the strength of mastication diminished. The teeth did not seem to meet properly, and the lower lip and chin felt numb.

There was no history of previous trauma, serious illness, or operations. The family history was noncontributory.

Physical examination showed a well-developed and well-nourished young man with marked asymmetry of the face. The right eye had a subconjunctival hemorrhage and there was periorbital edema and ecchymosis. A transverse laceration, 1.5 cm. in length, could be seen over the skin at the lower margin of the right orbit, and another, 1 cm. in length, extended over the right side of the upper lip. The area over the right zygomatic process was swollen. There was slight obstruction of the nose with deviation of the septum to the right. An acute infection was present in the upper respiratory system, but this was subsiding. The mandible was asymmetrical, with prominence on the right. Opening of the jaw was limited. There was slight tenderness near the angle of the jaw on the left and in the midportion of the right mandible. Examination of the heart revealed a harsh apical systolic murmur. The temperature was 101.5° F. (by rectum), the pulse rate 100, and the respiratory rate 20. The white-cell count was 10,300. Urinalysis and a blood Hinton test were negative.

X-ray examination of the jaws and sinuses showed a fracture of both sides of the mandible, with the fracture line passing through the first molar on the right (Fig. 13) and through the unerupted third molar on the left side of the mandible (Fig. 14). There was a fracture through the medial part of the right zygoma. The right antrum appeared cloudy and there was marked soft-tissue swelling opposite the lower half of the orbit. The diagnosis was bilateral fracture of the mandible and fracture of the right zygoma, with hemorrhage into the right antrum.

The patient was admitted to the main hospital on May 24 for reduction of the fracture. The preoperative medication consisted of 1½ grains of nembutal orally the night before the operation, and ⅙ grain of morphine and ⅛ grain of atropine subcutaneously one hour before the operation.

Under intravenous pentothal sodium anesthesia, an incision was made over the alveolar crest on the right side. The unerupted third molar was removed by means of an elevator. The right lower first molar was next extracted with forceps. Sulfanilamide powder was put into the extraction wounds and between the fragments. Intermaxillary ligation was then applied by wiring together in pairs all the available maxillary and mandibular teeth, in order to close the occlusion. There was not much support for the posterior fragments, but since there had been no marked displacement before the extraction of the teeth, it was believed that this method might be satisfactory unless the postoperative x-ray films showed displacement, in which event additional treatment would be indicated. The x-ray films, however, showed satisfactory alignment (Figs. 15 and 16).

The patient was kept in the hospital until May 27, when he was discharged to the Outpatient Department. On July 1, the wires were removed, and clinical

evidence showed excellent bony union in the fracture sites. X-ray examination confirmed this.

DISCUSSION

Intermaxillary wiring is the simplest method for reduction of mandibular fractures within a dental arch. Fractures posterior to the dental arch and without displacement of the ramus likewise do well with this method. Should the ramus be displaced, either from an accident or from removal of the unerupted teeth, stabilization of the jaw should be effected by an arm extending to the ramus from a small splint attached to the teeth, by direct wiring after open reduction, or by skeletal fixation.

Case 6

Comminuted Fracture of the Mandible

L. O'K. (No. 409221), a 33-year-old man, was referred to the Dental Clinic for treatment of a fracture of the jaw. His chief complaint was that several teeth were loose in the front of the lower jaw.

Six days previously, the patient had been in a fist fight where he was severely beaten about the face and jaws. He was knocked unconscious for two minutes, and then walked home. Nothing was done about his injuries until four days later, when some teeth that had been loosened became sore. His dentist told him that his jaw was broken and referred him to this hospital.



Fig. 17.—Compound comminuted fracture of mandible with alveolar fracture involving several teeth.

Physical examination showed a well-developed and well-nourished young man in mild distress. There was a cut on the right side of the chin below the jaw and one on the forehead which had been débrided and stitched. Movement of the jaw was limited because of pain. The lower right anterior teeth and the premolars were extremely loose, and the attached alveolar process was separated from the mandible. There was movement and crepitus on manipulation

of the lower right jaw. There were no teeth on the lower right side posterior to the first premolar. The temperature was 99.5° F., the pulse rate 80, and the respiratory rate 19. The white-cell count was 12,000. Urinalysis and a blood Hinton test were negative.

Roentgenologic examination showed a fracture through the socket of the lower right first premolar, extending upward and forward almost to the midline of the mandible, thus involving the lower right anterior teeth in the line of fracture (Fig. 17).



Fig. 18.—X-ray film showing use of Roger Anderson appliance.



Fig. 19.—Lacerations on chin sutured, and Roger Anderson appliance.

The diagnosis was fracture of the body of the right mandible and of the alveolar process of the lower right incisor area.

The patient was admitted to the Hospital and placed on bed rest and a liquid diet. He was given 2 Gm. of sulfadiazine at once and 1 Gm. every four

hours thereafter, and 2 drams of sodium citrate three times a day. It was planned to use skeletal fixation with the Roger Anderson appliance for reduction of the fracture. When the sulfadiazine level of the blood had reached 7.8 mg. per 100 c.c., he was prepared for operation. Preoperative medication consisted of $1\frac{1}{2}$ grains of nembutal orally the night before the operation, the same dose in the morning, and $\frac{1}{6}$ grain of morphine and $\frac{1}{100}$ grain of atropine subcutaneously one hour before operation.

Under intravenous pentothal sodium anesthesia, with endotracheal intubation, four pins were inserted in the mandible, two in the anterior fragment and two in the posterior fragment. They were united with the crossbar attachment, one to each pair. By intraoral approach, the comminuted and detached segment of the alveolar process, containing four teeth, was removed, and the oral mucosa closed with silk sutures. The left lower second incisor, which was loose, was extracted. The fracture was then reduced and the Roger Anderson appliance united with a long bar (Fig. 19). Dressings were applied around the pins and over the cheek (Fig. 20).

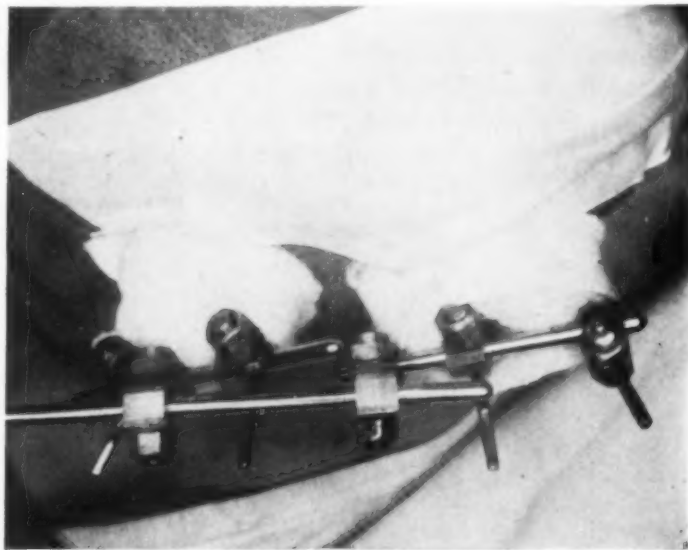


Fig. 20.—Dressings applied to protect insertion of pins and laceration of lip.

The patient was discharged on the fourth postoperative day, to be followed in the Outpatient Department. Subsequent checkups showed reduction and immobilization to be excellent (Fig. 18). The patient was comfortable and could chew a soft-solid diet. The appliance was removed seven weeks after reduction, when complete union had resulted.

DISCUSSION

This patient could have been treated by intermaxillary ligation had it not been for the alveolar fracture which necessitated the removal of the mandibular teeth. In case of an insufficient number of teeth, reduction by means of the Roger Anderson appliance gives satisfactory results. It also allows access to the wound in the mouth and enables the patient to eat semisolid food.

Case 7**Fracture of the Neck of the Condyle**

A. L. (No. 83431), a 9-year-old boy, entered the Emergency Ward on Feb. 19, 1943, complaining of pain and tenderness of the jaw, especially on motion.

While coasting the day before, the patient was thrown against a telephone pole, striking his chin. He had a nosebleed and became dizzy, although he did not lose consciousness. X-ray films taken by his physician were said to have shown a fracture of the nose and antrum.

At physical examination the patient appeared to be well developed and well nourished. He was quite apprehensive and in considerable pain. In front of the right ear there was a slightly swollen area which was extremely painful to the least pressure. The teeth were in malocclusion and there was marked trismus. Attempts to move the jaw produced acute pain. On forward motion, the mandible deviated to the right. The temperature, pulse, and white-cell count were normal.

Roentgenologic examination showed a fracture of the condyle of the mandible on the right side with slight medial displacement of the lesser fragment. Its position in the anteroposterior direction could not be determined, but it seemed to be rotated anteriorly (Fig. 21). There was also a break in the lateral wall of the left antrum and dense clouding of the cavity. This was probably due to hemorrhage caused by trauma. The diagnosis was fracture of the neck of the right condyle.



Fig. 21.—X-ray film showing fracture just below head of condyle.

The jaws were brought into functional occlusion and immobilized with fixed intermaxillary wiring. The patient was kept under observation in the Dental Clinic. On March 18 the wires were removed. Clinical examination showed the

reduction of the fracture to be entirely satisfactory, and x-ray films confirmed the clinical evidence.

DISCUSSION

Simple condylar fractures without much displacement heal well if intermaxillary ligation is employed. Care must be taken that muscular spasm will not open the bite in the incisor region. When there is marked overriding of the fragments, the insertion of a bite block between the posterior molars is recommended. Elastic traction is applied by attaching a Jelenko or a Winter splint to both arches to bring the ramus down; the appliance acts as a lever with the bite block the fulcrum.

V. OSTEOMYELITIS OF THE JAWS

Case 8

Aseptic Chronic Osteomyelitis of the Mandible

R. G. (No. 394568), a 12-year-old boy, was referred to the Hospital on Feb. 27, 1943, for diagnosis and treatment of persistent painless swellings of the submaxillary area.

In September, 1942, the patient first noticed painless swellings on both sides of the under surface of his jaw. No treatment was instituted. Four months later, when he had chicken pox, with a temperature of 104° F. for two days, the swellings increased in size and became tender. After he recovered from this illness, the left submaxillary area became nearly normal. However, the swelling on the right persisted.

There was no history of injury to the jaw. Except for measles in early childhood and the recent attack of chicken pox, the patient had enjoyed good health all his life. The family history was nonecontributory.

Physical examination showed a healthy, rather obese child in no pain. The temperature was 98.4° F., the pulse rate 100, and the respiratory rate 20. A hard, smooth, well-defined tumor mass could be felt around the inferior border of the right mandible. It seemed to be an extension of the jawbone and was not painful to touch (Fig. 22). There was no thickening of the overlying soft tissues. The submaxillary lymph nodes on both sides were palpable and tender. No other nodes were palpable in the neck, axillae, or groins. Clinical examination of the teeth was negative.

The white-cell count was 14,000, with 71 per cent polymorphonuclear leucocytes. The red-cell count was 4,850,000 and the photohemoglobin was 12.8 Gm. per 100 c.c.

Roentgenologic examination revealed a small area of bone destruction in the subapical portion of the right mandible below the second bicuspid and the first molar. The area included the lower cortex, from which arose a semilunar, sharply defined area of new bone formation of irregular pattern (Fig. 23). No evidence of bone disease was present on the left side. The anteroposterior view showed minimal areas of periosteal new bone formation close to the swelling on the right side. Films of the teeth and of the chest were negative.

The patient was seen at a Tumor Clinic conference, where it was concluded that the swelling of the right jaw was due to low-grade infection or to trauma,

that the patient should be kept under observation, and that no biopsy should be performed at that time. The case was reviewed at the Osteomyelitis Clinic, where it was concluded that the patient should be kept under observation until



Fig. 22.—Patient with swelling of right mandible.

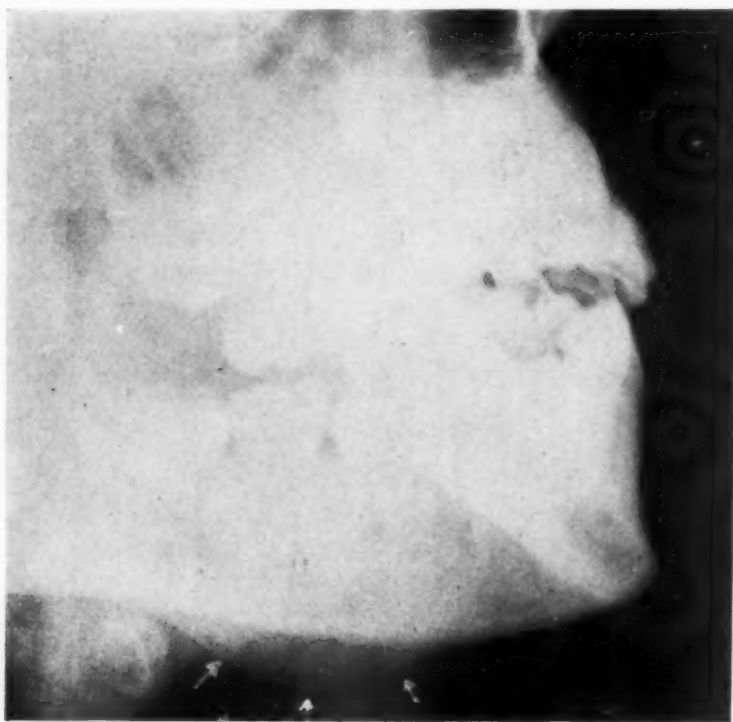


Fig. 23.—X-ray of right mandible, showing subperiosteal swelling.

the appearance of further symptoms. The possibilities of Ewing's tumor, low-grade osteomyelitis, calcifying hematoma, lymphoma, fibro-osteoma, and tuberculosis were considered.

The patient was kept under observation for six weeks, during which time there was very little change in his condition. It was then decided to admit him for conservative treatment. He entered the hospital on April 14 and was placed on bed rest and a high-fluid, high-vitamin diet. He was given sulfadiazine, 2 Gm. at once and 1 Gm. every six hours thereafter, and sodium citrate, 2 drams twice a day. There was no significant improvement after several days. He was discharged on April 20, and observation was continued until May 26, when a biopsy of the mass was taken.

Preoperative medication consisted of $\frac{1}{8}$ grain of morphine and $\frac{1}{200}$ grain of atropine injected subcutaneously one hour before operation. Under intravenous pentothal sodium anesthesia, an incision was made below the mandibular border anterior to the external maxillary artery and carried through the platysma. A hard, solid mass, firmly attached to the bone, was isolated by blunt dissection. It could be incised with a scalpel, and a large longitudinal wedge extending into the spongiosa of the bone was removed. Soft tissue having the consistency of semicalcified material was found in the spongiosa. These findings seemed to be consistent with the tentative diagnosis of fibro-osteoma.



Fig. 24.—Photomicrograph, low magnification, showing small abscess surrounded by chronic osteomyelitis.

The fascia and platysma were sutured with chromatinized catgut, the skin with silk. A rubber-dam drain was inserted in the wound to prevent the formation of a hematoma.

The excised material showed a small abscess surrounded by chronic osteomyelitis (Fig. 24).

The patient was discharged to the Outpatient Department on the second postoperative day. There he was observed for six weeks, or until July 6. At that time a small amount of pus appeared at the site of the incision. Complete excision and curettage of the lesion was therefore advised. The patient was re-admitted to the Hospital and treated by chemotherapy until a blood level of 7.6 mg. per 100 c.c. was reached.

One-eighth grain of morphine and $\frac{1}{100}$ grain of atropine were injected subcutaneously one hour before operation. Under intravenous pentothal sodium anesthesia, an elliptical incision was made on the lower border of the right mandible near the chin, through multiple fistulas. The platysma was divided and the mandible exposed. The projecting bone was excised. This bone was easy to cut. It seemed to be firmly cancellated and there was no evidence of infectious granulation tissue or of pus in the deeper part of the wound. The mandible was shaped to its normal size by means of chisels and a bone file, and sulfanilamide powder was dusted into the bone. The subcutaneous tissue was then sutured with chromatinized catgut. A subcuticular Kaldernie suture was used to close the skin incision. A small rubber-dam drain was inserted in the wound, to be removed after twenty-four hours.

By this operation the deforming part of the bony tumor was removed and the normal contour of the mandible restored. The patient was discharged on the fourth postoperative day, to be followed in the Outpatient Department. The sutures were removed on July 20. At the time of writing, the patient is still under treatment. The prognosis is good.

Culture of the pus showed no growth, and the excised bone again showed chronic osteomyelitis.

DISCUSSION

This is an unusual case because of the inability to find the causative factor. There is of course a possibility that the boy had received an injury and was unwilling to admit it. The negative culture is more consistent with a lesion of traumatic origin than with infection, which could only be explained on a hematogenous basis.

Case 9

Chronic Osteomyelitis of the Mandible

J. F. (No. 360745), a 17-year-old boy, was seen at the Hospital on May 28, 1943, with a chief complaint of multiple joint pains.

Approximately one year previously the patient had begun to have trouble with his left hip. Shortly after a swim he sensed a peculiar feeling of tightness in the left hip joint, and within a few days he felt sharp pains in the joint when he ran. One month later, he came to the hospital and was seen in the Orthopedic Clinic, where x-ray films of the joint proved negative. He was advised to remain in bed for one week. He did so, and the pain disappeared temporarily; however, it returned after a brief period, and, on July 4, 1942, became so severe that he was forced to go to bed. A physician made a diagnosis of rheumatic fever. In August, 1942, the right knee also began to ache, and a month later, the ball of the right foot became swollen and painful. These symptoms disappeared in a few weeks, and there were no further attacks in the knee or the foot, although the hip pain continued with occasional brief remissions until March, 1943.

In November, 1942, the patient's right jaw began to swell and became painful. His dentist extracted two lower teeth on the right side, after which the pain and swelling subsided, though there still remained a hard "lump." In

April, 1943, a hard, indurated swelling recurred, this time on both sides, and at the same time the pain in the hip returned. The patient therefore reported to the Hospital.

There was no family history of tuberculosis, cancer, heart disease, or arthritis. The patient's 21-year-old brother had been ill with rheumatic fever at the age of 5 years, and an 11-year-old sister was in bed with the same disease at the time the history was taken. Both parents were in good health.

Physical examination showed a well-developed but poorly nourished boy with moderate acne vulgaris on the face. He did not limp and was in no apparent distress. The hip symptoms were diagnosed as rheumatoid arthritis by the Arthritic Clinic of the Hospital.

The white-cell count was 7,600, the red-cell count 4,370,000, and the hemoglobin 90 per cent. Chemical analysis revealed the following: calcium 11.2 mg. per 100 c.c., phosphorus 3.2 mg. per 100 c.c., phosphatase 3.3 units, and fasting sugar 74 mg. per 100 c.c. The sedimentation rate was 0.90 mm. per minute, and the hematocrit 42. Urinalysis and a blood Hinton test were negative.

X-ray examination of the right jaw showed a process of destruction and new bone formation involving the anterior part (Fig. 25). The process had a mottled appearance and extended diffusely through the bone, beginning in the anterior portion and reaching the level of the medial root of the second lower molar. X-ray films of the left jaw showed a bone lesion similar to that on the right, though less extensive (Fig. 26). One roentgenologist believed that, although a possible area of sequestration could be seen, the condition resembled malignant tumor more than osteomyelitis, and pointed out that lymphoma or metastatic malignancy could produce such a picture. Another expressed the opinion that the condition appeared to be consistent with osteomyelitis. The next day, the patient was seen in the Dental Clinic. He was found to have a well-defined hard swelling along the inferior border of the right mandible extending from the second molar area anteriorly to the canine area. It was not tender and seemed to be part of the jawbone itself. No symptoms were apparent on the left jaw. There were single enlarged submaxillary lymph nodes, not tender to touch, on both sides of the jaw. The x-ray films previously described were reviewed. A diagnosis of chronic osteomyelitis or possibly fibro-osteoma was made, and a biopsy of the mass advised.

The patient was admitted to the Hospital and sulfadiazine was administered until a blood level of 10.6 mg. per 100 c.c. was reached. Preoperative medication consisted of $1\frac{1}{2}$ grains of nembutal orally the night before the operation, and $\frac{1}{6}$ grain of morphine and $\frac{1}{150}$ grain of atropine subcutaneously one hour before operation.

Under endotracheal nitrous oxide-oxygen-ether anesthesia, an external incision was made underneath the anterior part of the right mandible extending from the canine area to the first molar area. The platysma was divided and the periosteum was incised. Although the outer surface of the bone was completely intact, it was expanded and very much softer than normal bone (Fig. 27). A window about 4 cm. long and 2 cm. wide was cut with a chisel and the outer layer of bone was removed. No pus or inflammatory tissue was found. The bone seemed to have been transformed into a granular, firmly calcified structure.

On further exploration, a very hard piece of bone which appeared to be a sequestrum was found. This was surrounded by soft tissue and could be easily separated from the bone. After bleeding had been arrested with adrenalin, sul-



Fig. 25.—X-ray of right mandible, showing process of destruction and new bone formation diagnosed as chronic osteomyelitis.



Fig. 26.—X-ray of left jaw, showing similar but less extensive involvement.

fanilamide powder was dusted into the cavity in the bone. The subcutaneous tissues were closed with chromaticized catgut, and the skin, with Kaldermie interrupted sutures. A dressing was applied after a rubber-dam drain had been

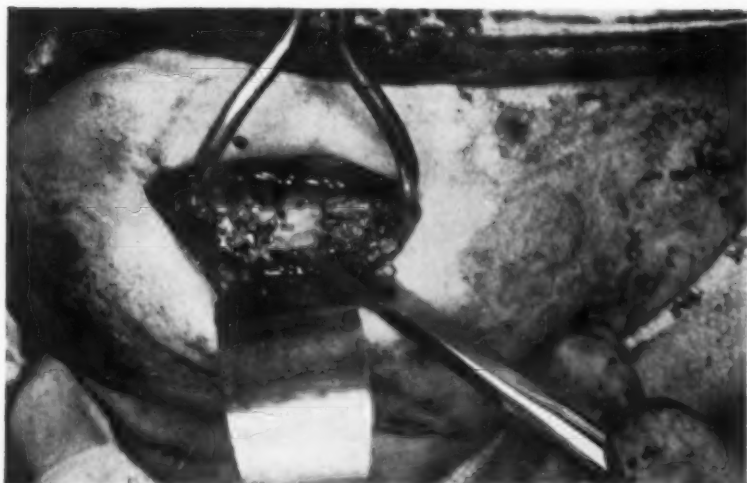


Fig. 27.—Incision at lower border of mandible, exposing the bone to be fenestrated.

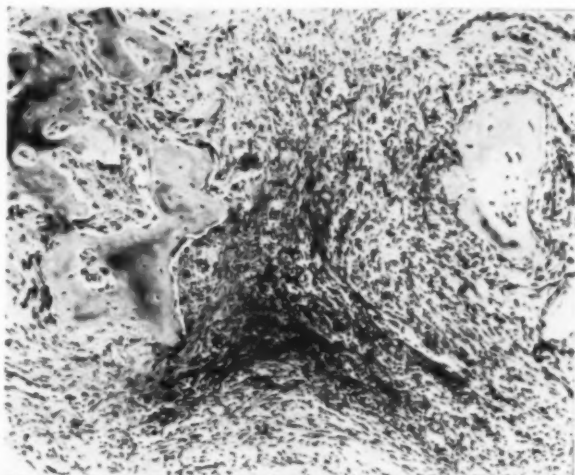


Fig. 28.

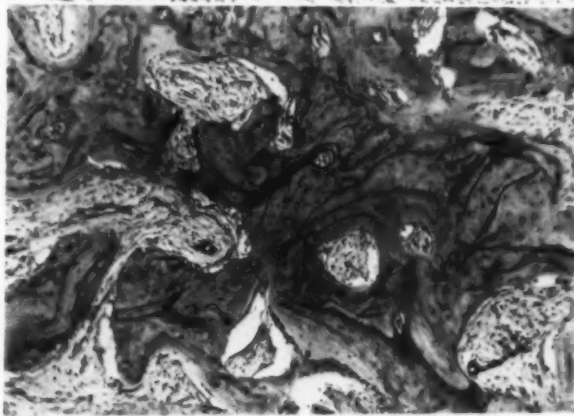


Fig. 29.

Fig. 28.—Photomicrograph of excised bone, showing chronic inflammatory process diagnosed as osteomyelitis.

Fig. 29.—Photomicrograph showing repair and callus formation in chronic osteomyelitis.

inserted. After the external operation was completed, the lower right first molar was extracted since the x-ray film had revealed slight infection in this tooth.

Pathologic examination of the excised material showed chronic osteomyelitis (Fig. 28). Some sections showed considerable evidence of repair and callus formation (Fig. 29).

Recovery was good. There was a small amount of serosanguineous material continually draining from the wound. Culture of the discharge showed a few diphtheroids. The drainage subsided completely by June 24 and the wound healed with no further complication. The patient was treated with sulfadiazine and by irrigations with Dakin's solution until July 10. He was discharged July 11, to be followed in the Outpatient Department.

Immediately following the operation there was remission of the joint symptoms. According to the Arthritic Clinic, this was probably the result of the effect of general anesthesia on the disease. A month later, the following report was made by the Arthritic Clinic:

"Since the patient's discharge from the Hospital about a month ago, his symptoms have subsided remarkably. He has been gaining weight, has felt less tired, and is a great deal more ambitious than at any time during the past year. He notices no pain or difficulty whatsoever in walking, although he does not feel that he could run. The right side of the jaw has healed very well."

The following week, a few days before the time of writing, the patient reported to the Dental Clinic complaining of symptoms in the left jaw similar to the previous ones. It was decided to keep him under observation for a short period. If there is no improvement, he will be readmitted and placed on sulfadiazine, and the other side of the jaw will be operated on.

DISCUSSION

This is a case of osteomyelitis caused by subvirulent infection. The treatment was limited to the right side of the jaw because of the questionable diagnosis. If a preoperative diagnosis of osteomyelitis could have been established without doubt, or if signs of infection had been demonstrable during the operation, the left side, where the x-ray film showed an area of destruction, would have been opened and drained as well.

Case 10

Subacute Osteomyelitis of the Mandible

R. S. (No. 345402), a 46-year-old Italian laborer, was admitted to the Emergency Ward on Feb. 6, 1943, with a chief complaint of pain and swelling of the left lower jaw of two weeks' duration.

The patient first noticed a small, painful swelling of the gums behind the last molar tooth of the left lower jaw. The next day, when the jaw started to swell, he saw his dentist, who told him to apply an ice bag to the face and to gargle with a warm salt mouthwash. No improvement resulted, and the swelling increased. One week later a small incision was made in the gum. The patient was given some "white pills" and told to continue the same home treatment.

Physical examination on entry showed a patient in mild distress. There was a soft, diffuse, edematous swelling, fairly tender to palpation, over the left

cheek and the angle of the left jaw. The left submaxillary lymph nodes were enlarged and tender. The patient had trismus of the jaws, which could be opened to only one-half the normal width. The mouth hygiene was poor and the breath was foul. The gingiva of the lower left jaw from the first premolar back to the retromolar triangle was acutely inflamed and tender. Over the lower left



Fig. 30.



Fig. 31.

Figs. 30 and 31.—X-ray films of mandible in extensive subacute osteomyelitis, involving sub-apical area and inferior border.

third molar there was a loose, necrotic gingival flap, from the margins of which pus could be expressed. The gingival attachment on the buccal aspect of the left posterior teeth was loose. The partially erupted lower left third molar was badly broken down and was loose and tender to percussion. The remaining posterior teeth on the left side were firm. The temperature was 99.6° F., and the pulse rate 110. The white-cell count was 12,000. Urinalysis and a blood Hinton test were negative.

The patient was placed on strict bed rest, and fluids were forced to the amount of 3,000 c.c. a day. Sulfadiazine (2 Gm. at once and 1 Gm. every four hours thereafter) and sodium citrate (2 drams three times a day) were given, and hot saline mouth washes were administered hourly. A soft-solid, high-vitamin diet was prescribed. The mouth was painted with a 2 per cent solution of aqueous gentian violet three times a day. The patient was kept in the Emergency Ward for three days. During this time there was profuse purulent discharge from around the third molar. When the swelling and the infection had subsided, the lower left third molar was removed. The patient was discharged, to be followed in the Outpatient Department. He failed to keep his appointments, but returned two weeks later with an acute exacerbation of the previous symptoms.

Physical examination at this time showed, in addition to the previous clinical picture, that all the posterior teeth in the lower left jaw were loose. A considerable amount of pus could be expressed from around the gingival crevices. The temperature was 99.4° F., and the pulse rate 100. The white-cell count was 6,000, with 52 per cent polymorphonuclear leucocytes, 29 per cent large and small lymphocytes, and 19 per cent monocytes. The urine was negative.



Fig. 32.—Photomicrograph showing osteomyelitis with large amount of chronic inflammatory granulation tissue.

X-ray films taken at this time showed a diffuse rarefaction of the body of the mandible from the third molar region forward to the first premolar (Figs. 30 and 31). The Radiological Department concluded that this process was most likely due to malignancy, probably with superimposed osteomyelitis. Because the question of malignancy was raised by the roentgenologist, the patient was presented at the Tumor Clinic conference the next day. Here a diagnosis of osteomyelitis was favored, though a possible superimposed malignancy was suspected.

The patient was admitted to the Hospital, and since it was believed that the clinical signs indicated osteomyelitis rather than malignancy, he was given sulfadiazine, 2 Gm. at once and 1 Gm. every four hours thereafter, and sodium

citrate, 2 drams three times a day. Fluids were forced to 3,500 c.c. daily. It was decided to treat the conditions surgically the following day. The night before the operation, the patient was given $1\frac{1}{2}$ grains of nembutal, and this dose



Fig. 33.—Postoperative results, intraoral.



Fig. 34.—Postoperative x-ray film.

was repeated the following morning. One-sixth grain of morphine and $\frac{1}{100}$ grain of atropine were injected subcutaneously one hour before operation.

Under intratracheal ether anesthesia, an incision was made along the gingiva on each side of the involved teeth, from the third molar region to the canine.

Two molars and two premolars were removed. Considerable granulation tissue and a slight amount of pus were adherent to them. Several bone sequestra were removed, from the cancellous part of the bone and from the outer cortex. The latter was cut down to an even level, and the inflammatory tissue was removed by careful curettage and placed in Zenker's solution for pathologic examination. After sulfanilamide and sulfathiazole powder had been inserted in the bone cavity, a strip of vaseline gauze was placed in the wound and held with two silk sutures, joining the outer and inner borders of the incision.

An extraoral incision was made below the inferior border of the mandible and through the subcutaneous tissue to the bone. No loose pieces of bone were encountered, but as a sequestrum was expected to form at this point, a rubberdam drain was inserted in the wound and sutured to the edge of the incised skin. A dry gauze pack was placed on the outside, and a Barton bandage was fastened around the head.

The postoperative diagnosis was chronic osteomyelitis. There were no signs of carcinoma. This was confirmed by the pathologic examination, which showed acute and chronic osteomyelitis (Fig. 32).

Sulfadiazine was continued until the sixth postoperative day, when the patient was discharged, to be followed in the Outpatient Department. Healing was uneventful and the prognosis was good. The patient was discharged from this department on July 23, completely relieved. The oral condition at that time is shown in Fig. 33. X-ray examination showed complete healing (Fig. 34).

DISCUSSION

In subacute osteomyelitis, the symptoms are very mild and the cause of bone destruction seen in the x-ray films is therefore not easily recognized. Radical surgical treatment of osteomyelitis preceded by chemotherapy frequently produces rapid and complete recovery. But this result cannot be expected in every case, and drainage should not be omitted because of the general and local administration of sulfonamides.

Case 11

Acute Osteomyelitis of the Mandible Following Submental Phlegmon

Mrs. O. D. (No. 29558), a 31-year-old woman, was brought into the Emergency Ward on March 23, 1943, complaining of pain and swelling underneath the chin and difficulty in swallowing.

Two days previously she had had a lower left molar extracted by her dentist. That evening, swelling started around the left jaw and below the chin. She had a shaking chill, and was seen by her physician, who treated her with sulfadiazine. The swelling of the mandible increased to such an extent that she found it hard to swallow.

The patient stated that she had congenital syphilis, for which she had been treated.

Physical examination showed a moderately obese woman in acute distress. She was somewhat deaf in both ears and had interstitial keratitis. There was a large, indurated swelling in the submental region of the mandible, extending downward in the neck to below the thyroid cartilage (Fig. 35). There was con-

siderable trismus. Such examination of the mouth as was possible revealed considerable edema of the sublingual tissue, pressing the tongue slightly upward. There was a foul odor to the breath, and the mouth was in poor hygienic condition. There was a fresh extraction socket in the lower left molar area. The temperature was 99.5° F., and the pulse rate 80, and the respiratory rate 20. The white-cell count was 14,600, and the red-cell count 4,360,000. Roentgen-ray examination of the jaw showed no apparent bone lesion.

The diagnosis was submental phlegmon, or possibly Ludwig's angina.



Fig. 35.—Patient with submandibular swelling.

Because of her physical condition, the patient had been admitted in the care of the Surgical Department. She was put on strict bed rest, and a tracheotomy set was kept ready at the bedside in case of respiratory embarrassment. Fifteen hundred cubic centimeters of a 5 per cent solution of glucose and salt were given intravenously, and fluids were forced to the amount of 3,500 c.c. daily. Sulfadiazine was administered, 5 Gm. intravenously and 1 Gm. by mouth every four hours. Flaxseed poultices were applied and the mouth was irrigated with hot saline solution every hour. Three days later, when a sulfadiazine blood level of 5.7 mg. per 100 c.c. was reached, the submental phlegmon was incised and drained under local anesthesia. When the incision was made, about 29 c.c. of foul, yellowish pus drained out. A drain was placed in the wound. A culture of the pus revealed abundant nonhemolytic streptococci.

A few hours after the operation, the patient had a chill and the temperature rose to 105.3° F. There was a lump in the throat, but no increase in respiratory difficulties. The fever subsided within four days, and the swelling receded. The patient was discharged on the tenth postoperative day.

Postoperative checkups were satisfactory until April 26, when the patient reported to the Dental Clinic complaining of an acute painful swelling at the

angle of the left mandible. The submaxillary and cervical lymph nodes were enlarged and tender. Examination of the mouth showed discharge of pus from the extraction socket. The temperature and white-cell count were normal.



Fig. 36.—X-ray film of left mandible, showing extensive osteomyelitis.

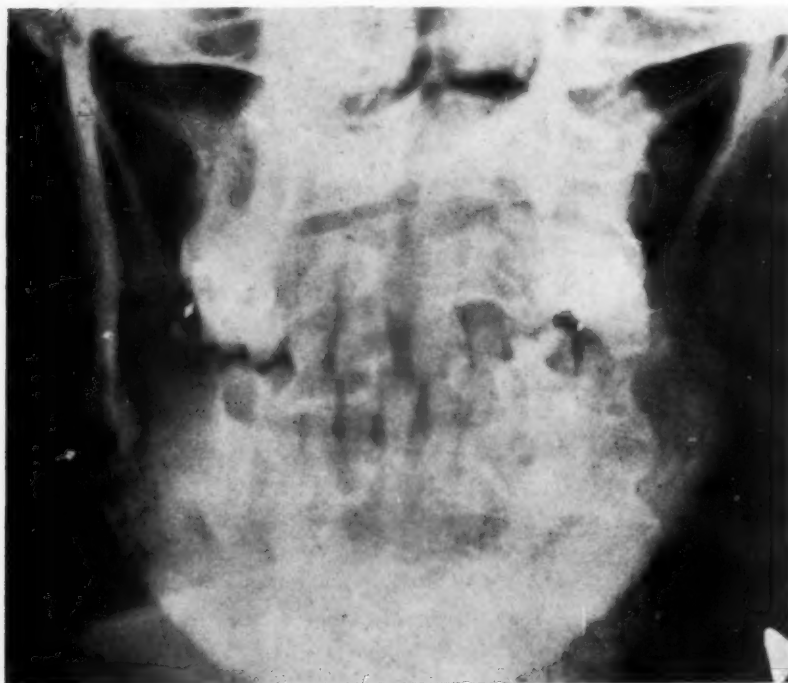


Fig. 37.—X-ray film showing osteomyelitis with pathologic fracture of left mandible.

Emergency x-ray examination showed an extensive osteomyelitis involving the posterior half of the horizontal ramus of the mandible on the left side, extending from the alveolar process through the lower cortex. The posterior edge of the destruction lay just above the angle. A sequestrum was seen in the region of the alveolar process, with what appeared to be a fragment of a root in the alveolar socket where the tooth was supposed to have been removed

(Fig. 36). The posteroanterior view showed evidence of a pathologic fracture (Fig. 37).

The patient was readmitted on April 26 for incision, drainage, and sequestrectomy. She was given sulfadiazine until a blood level of 4.6 mg. per 100 c.c. was reached, when she was prepared for operation in the same manner as before. Under intratracheal ether anesthesia, an incision was made over the alveolar border with vertical extensions at the anterior and posterior end over the external side of the mandible. The mucoperiosteum was elevated from the bone and retracted. Granulation tissue became visible and was removed, along with several bone sequestra and the root of the tooth. A large sequestrum on the outside of the mandible was then located and detached so that it could be removed. The bone edges were trimmed with rongeurs and forceps, and after débridement the mandibular nerve was visible in the bottom of the bone cavity. Sulfanilamide was dusted into the bone, a rubber-dam drain was inserted, and the mucosa was replaced and fastened by means of interrupted silk sutures.



Fig. 38.—Patient under treatment. Note Dakin's tube inserted into fistula.

The fistula in the submental region was then excised. A probe could be passed through it from the chin along the mandibular border to the area of osteomyelitis. The fistulous tract was widened, allowing the escape of a large amount of pus. A Dakin's tube was inserted in the tract and sutured to the skin (Fig. 38).

Because of the pathologic fracture which was evident, fracture wires were attached to the anterior teeth in the maxilla and the mandible for intermaxillary ligation. The teeth were wired together in the corrected position to

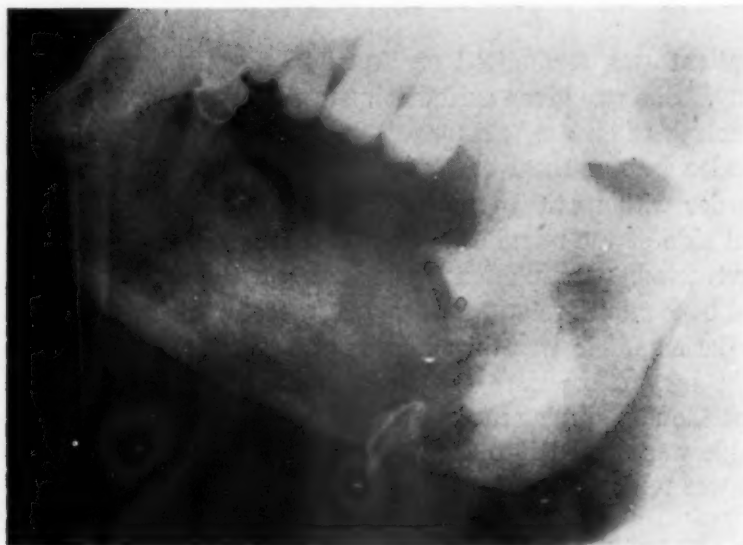


Fig. 39.—Immediate postoperative x-ray film with Dakin's tube in place.

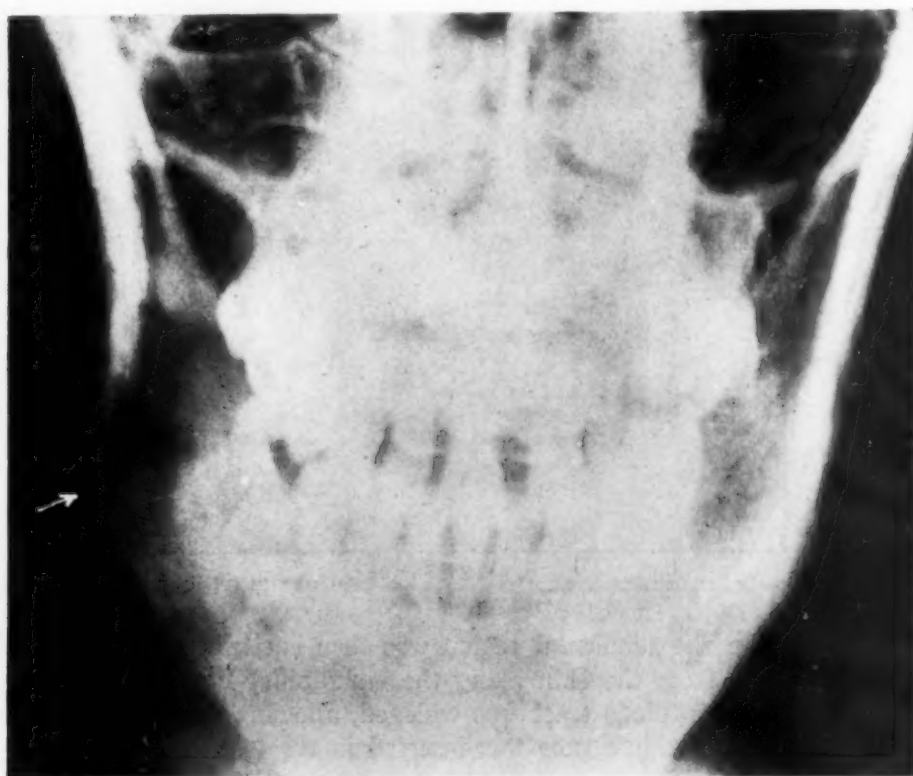


Fig. 40.—Anteroposterior roentgenogram six weeks after operation.

stabilize the fracture, and a Barton bandage was applied. Postoperative x-ray examination showed the removal of all sequestra, the ramus in good position, and continuity of the mandible re-established (Fig. 39).

Sulfadiazine therapy was continued until a blood level of 6.7 mg. per 100 c.c. was reached. Irrigations with Dakin's solution was given every three hours. On May 7, the sulfadiazine was discontinued and the Dakin's tube removed. The patient was discharged on May 10, to be followed in the Outpatient Department. On June 16, the intermaxillary wires were removed, and there was clinical evidence of firm union at the fracture site. The follow-up x-ray film taken at this time is seen in Fig. 40.

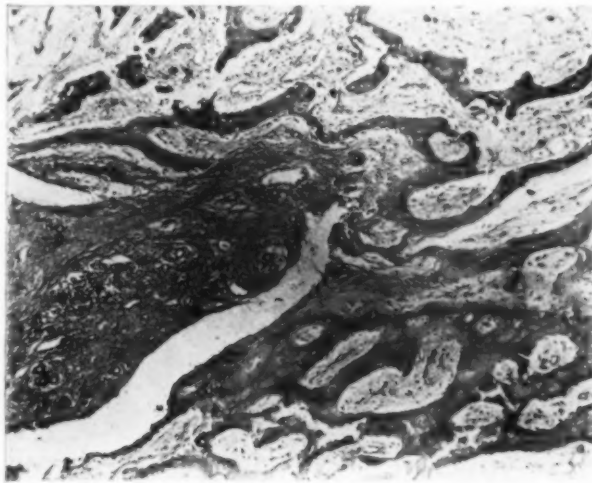


Fig. 41.—Photomicrograph showing sequestrum with chronic inflammatory granulation tissue.

Culture of the pus from the granulation tissue in the mouth and from the submental fistulas grew beta hemolytic and nonhemolytic streptococci. The bone specimens showed acute and chronic osteomyelitis (Fig. 41).

DISCUSSION

The case illustrates the importance of removing the focus of infection when treating fascial abscesses. The root of a tooth was overlooked or did not show in the x-ray film taken at the first admission. However, it was plainly visible in the film taken at the time of the patient's visit to the Dental Clinic (Fig. 38). The fact that a probe could be passed from the site of the fistula in the submental region to the angle of the jaw where the osteomyelitis occurred proves that the first infection for which she was treated arose from the dental focus.

VI. ANKYLOSIS OF THE JAW

Case 12

Partial Ankylosis Due to Pseudoarthrosis Following a Fracture Through Neck of Condyle

P. M. (No. 396680), a 19-year-old boy, was admitted on March 14, 1943, because of limitation of jaw motion and pain on mastication.

Ten years previously, the patient had been struck by an automobile, suffering a fracture of the nose and right mandible. He was unconscious for twenty-four hours after the accident, and could not remember what type of treatment was used at the hospital to which he was taken. He had no subjective symptoms after discharge. In December, 1942, however, he noticed that his face appeared lopsided, and his left jaw felt tight when he opened his mouth. He had difficulty in chewing large mouthfuls.

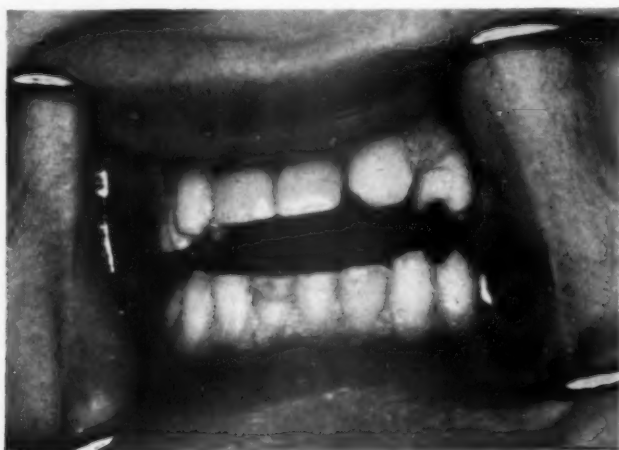


Fig. 42.—Pseudoarthrosis of right mandibular joint. Illustration shows the limited extent to which the patient could open the jaw before operation.

Physical examination showed an apparently healthy youth in no pain. There was marked asymmetry of the face, with deviation of the facial bones to the right. The mouth could be opened barely a centimeter (Fig. 42). There was motion at the ramus in front of and below the tragus of the ear. Most of the natural teeth were in functional occlusion. On forward motion, the jaw deviated to the right and could not be moved to the left. The temperature, pulse, and respirations were normal. The white-cell count was normal and a blood Hinton test was negative.

X-ray films taken in the anteroposterior position showed pseudoarthrosis of the right ramus below the temporomandibular joint (Fig. 43). The temporal view showed normal temporomandibular articulation. In the lateral view an area of increased density was seen, indicating hyperostosis of the neck of the right condyle (Fig. 44).

The diagnosis was pseudoarthrosis of the right temporomandibular joint.

It was decided to perform a mandibular osteoarthrotomy. Preoperative medication consisted of $1\frac{1}{2}$ grains of nembutal the night before the operation

and the following morning, and $\frac{1}{8}$ grain of morphine and $\frac{1}{100}$ grain of atropine subcutaneously one hour before operation. Under nitrous oxide-oxygen-ether endotracheal anesthesia, a vertical, angulated incision was made in front of the ear, starting about 1 cm. above the upper attachment of the ear and coming

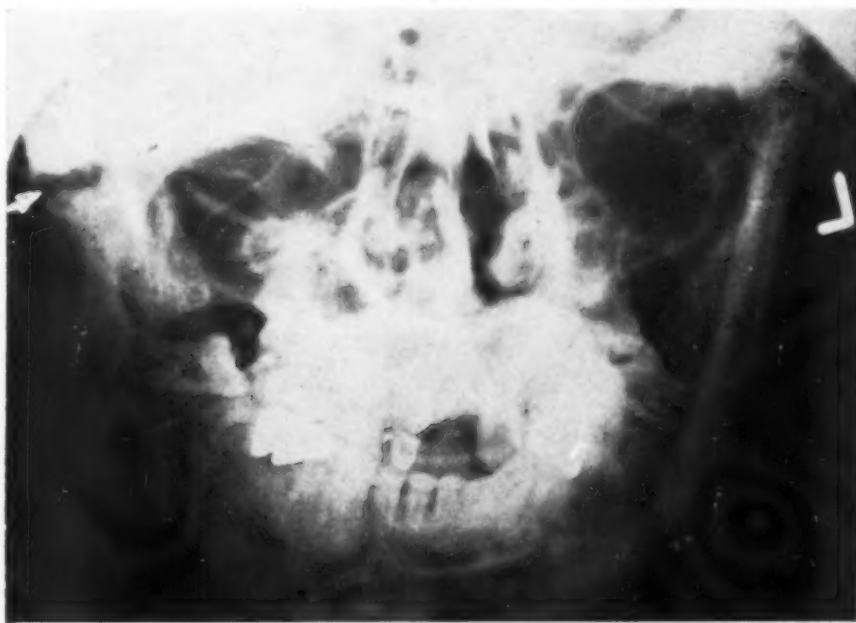


Fig. 43.—X-ray film showing pseudoarthrosis of right mandibular joint.

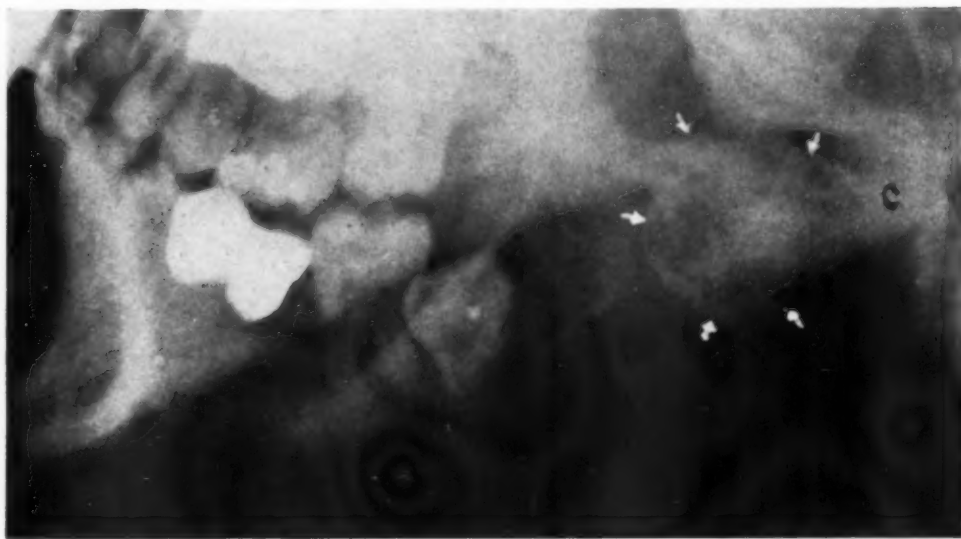


Fig. 44.—Lateral x-ray film showing hyperostosis of right mandibular joint. Note condyle.

to the level of the attachment of the lobe. The transverse facial artery was tied and cut. The subcutaneous tissue was divided and the zygomatic arch located. Thus the articulation came into view. There was very strong fibrous connective tissue attaching the periphery of the articular surface of the condyle to the

glenoid fossa. This tissue was detached by transverse incision so that the articular surface of the condyle could be freed. By dissection along the neck of the condyle, the pseudoarthrosis was reached and the condyle was divided at that point by chisel and periosteal elevator. The condyle was then removed, but it



Fig. 45.—Photograph taken after operation, showing incision.



Fig. 46.—Postoperative x-ray film, showing excision of condyle.

was found that a large mass of bone still extended medially and upward, forming the hyperostosis seen in the lateral x-ray film of the jaw. Since it was believed that this had been the cause of obstruction when the jaw was opened, its

removal was deemed advisable. This was accomplished with the cutting forceps. The end of the condyle was smoothed with rongeurs as well as possible. Sulfanilamide powder was placed in the cavity. A rubber-dam drain was inserted and the fascia was closed with catgut and the skin with Kaldernic sutures (Fig. 45). An x-ray film taken after the operation (Fig. 46) showed the condition after removal of the condyle. The amputated end shows a medial spur which is the remainder of the excised bony mass that could not be removed because of technical difficulties.



Fig. 47.—Photograph showing extent to which the jaw could be opened three days after operation.

The patient was discharged on the sixth postoperative day, to be followed in the Outpatient Department. As a result of the operation and of exercises which were recommended, the patient was soon able to open his mouth to the width of three fingers (Fig. 47).

DISCUSSION

This case is of interest because it illustrates the outcome of a condylar fracture ineffectively treated. Such fractures are common and are not always recognized. Furthermore, very little work has been done to improve the present methods of treating such cases. The treatment generally consists of intermaxillary ligation with no effort at reduction. In spite of this, the results in most cases are considered satisfactory. However, re-examination at a later date often reveals poor anatomic results (due to overriding of the fragments, displacement of the condyle, or dislocation of its head), which may cause limitation of motion and pain during mastication. If the jaw is ineffectively stabilized, as in this case, pseudoarthrosis may result. The hyperostosis, probably caused by hemorrhage and excessive formation of external callus, produced interference on opening the jaw. The inability to move the jaw to the left is explained by the fact that the external pterygoid muscle is attached above the point where the pseudo-

arthrosis occurred. Underdevelopment of the mandible (Fig. 45) frequently results when function is interfered with during development of the bone.

Case 13

Partial Ankylosis Due to Osteoarthritis of the Mandibular Joint

Mrs. S. M. (No. 409935), a 58-year-old teacher, was referred for diagnosis and treatment of pain in the right temporomandibular joint. Her chief complaints were pain over the right temple and in front of the right ear on movement of the jaw, and progressive inability to open the jaw to normal width. She also complained of pain on masticating hard foods.

One and one-half years previously, the patient first noticed pain and restriction of motion over the right temporomandibular joint. These symptoms grew progressively worse until she could open her jaw to only one-half the normal width and was forced to restrict her diet to soft foods.

Physical examination showed a patient who was healthy and normal in appearance. There was no significant asymmetry of the face. The right temporomandibular joint was not tender to palpation, but on mandibular movements some bruit could be heard in the region of the condyle. Some of the teeth had been extracted, but these had been replaced by partial dentures. The teeth were in functional occlusion, and the jaws could be opened only to 1.5 cm. (normal, 3.5 cm.). In protrusive occlusion the jaw deviated to the right, and in other excursions of the mandible there was a tendency to move the jaw to the right. There was considerable pain over the right temporomandibular joint when the patient bit hard on a throat stick. She had no other rheumatic tendencies or joint stiffness, except as a result of minor trauma. The temperature and pulse were normal. Urinalysis and a blood Hinton test were negative. The white-cell count was normal.

X-ray films taken before admission showed marked enlargement of the right condylar head (Fig. 48). The left mandibular joint is shown for comparison in Fig. 49. However, there was no bony ankylosis of the glenoid fossa. X-ray films in the closed- and open-mouth positions showed that the condyle did not move forward when the jaw was opened, as is usually the case.

The diagnosis was hyperostosis of the condyle due to osteoarthritis.

The patient was admitted to the Hospital for osteoarthrotomy. Preoperative medication consisted of $11\frac{1}{2}$ grains of nembutal the night before the operation and in the morning, and $\frac{1}{6}$ grain of morphine and $\frac{1}{150}$ grain of atropine subcutaneously one hour before operation.

The operation was performed under nitrous oxide-oxygen-ether anesthesia. The right temporal and preauricular regions were prepared with soap solution, iodine, and alcohol. A vertical, angulated incision was made anterior to the right ear. The fascia was divided and the zygomatic arch exposed. The transverse facial artery was ligated and cut. The joint was then located and the condyle was found to be greatly enlarged as expected. Only slight motion of the joint could be obtained. The capsule was next incised and the condyle exposed as far as the subcondylar region. An osteotomy was performed in the subcondylar region by means of a drill (Fig. 50). The condyle was excised (Fig. 51) and the remainder of the capsule was sutured to the masseter muscle after

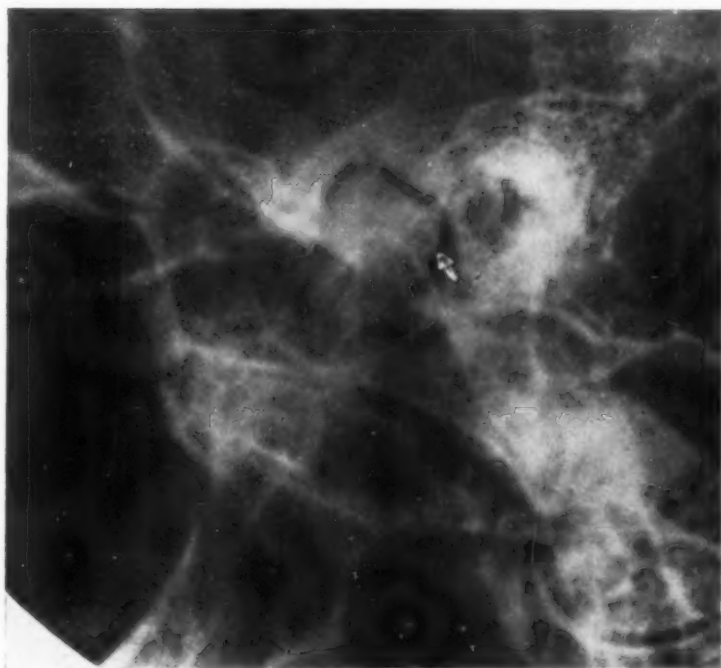


Fig. 48.—X-ray film of right condyle. Note enlargement and arthritic change.

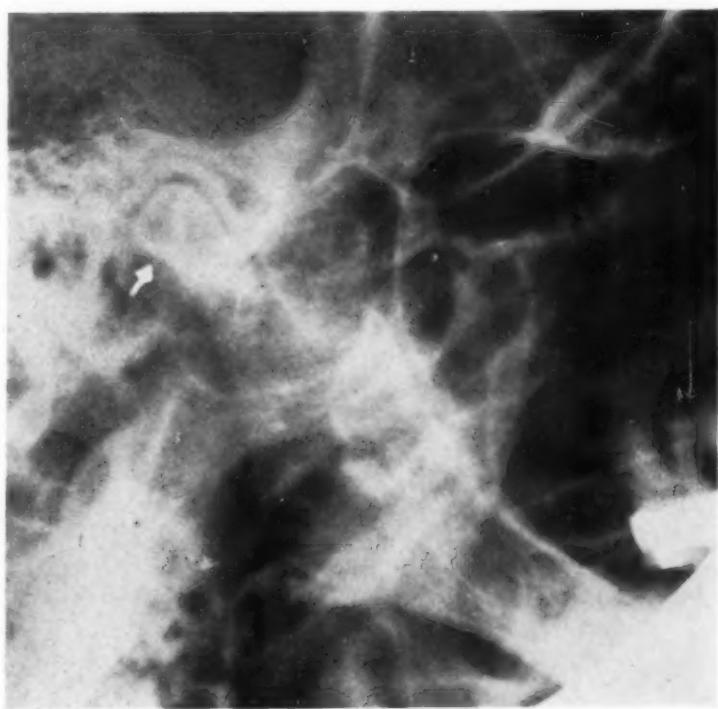


Fig. 49.—X-ray film of normal condyle on left side.

sulfanilamide powder had been dusted into the wound. The subcutaneous tissue was closed with chromitized catgut. A rubber-dam drain was inserted to prevent the formation of a hematoma. The skin was closed with Kaldernie sutures (Fig. 52).



Fig. 50.—Osteotomy performed at neck of condyle.

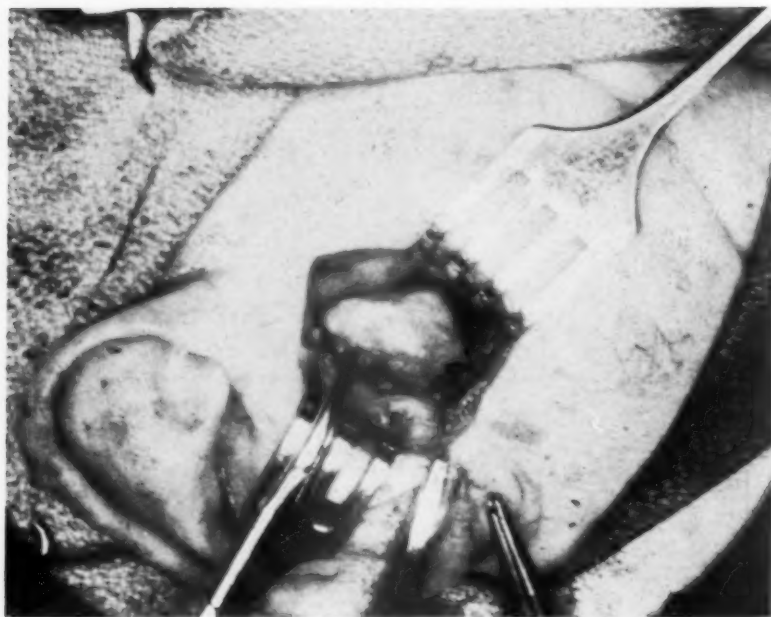


Fig. 51.—Exarticulation of condyle.

The postoperative diagnosis was fibrous ankylosis of the right temporomandibular joint.

On the second postoperative day the rubber drain was removed and on the seventh day the patient was discharged. The pain in the right condylar region

disappeared. The patient could open the jaw to normal width (Fig. 53). She was told to exercise the muscles of mastication both by vigorous chewing and by



Fig. 52.—Postoperative photograph, showing incision.

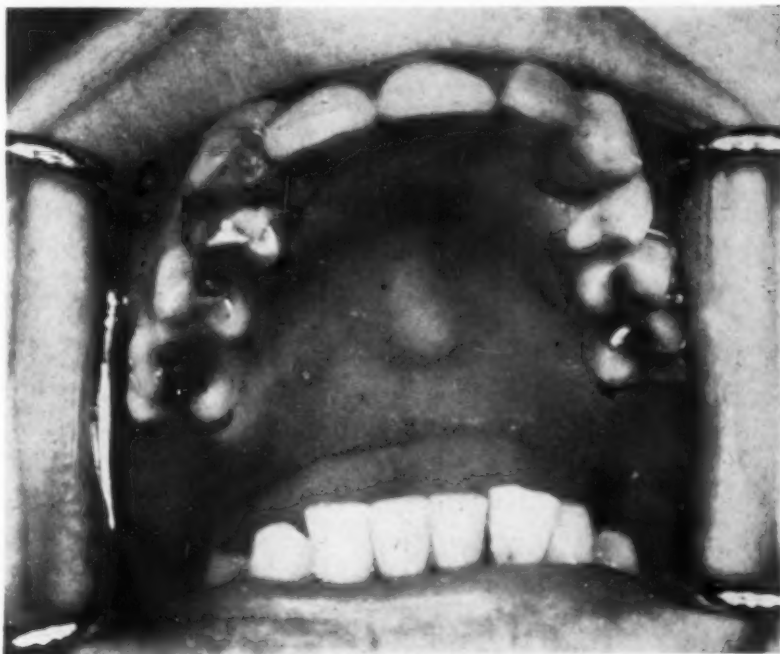


Fig. 53.—Extent to which the jaw could be opened postoperatively.

stretching the jaws apart with the fingers several times daily. Three and one-half weeks after the operation, she could masticate a normal diet with no difficulty.

The excised material was sent to the pathologic laboratory at the Harvard School of Dental Medicine, where the following report was made by Dr. Paul E. Boyle:

"Microscopic examination shows changes consistent with degenerative arthritis. These changes are fibrillation of the hyaline cartilage of the articular surface with loss of the major part of the cartilage and eburnation of the underlying bony structure (Fig. 54). The bone also shows evidence of considerable active remodeling. Marginal exostosis overlapping the synovial tissue of the joint is seen. In a number of areas the bone marrow extends to the articular surface. The marrow in such areas is somewhat fibrosed.

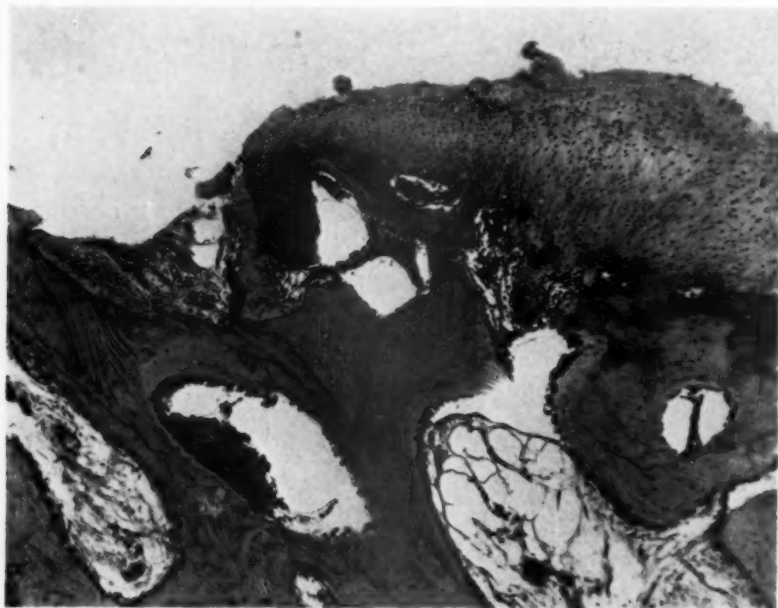


Fig. 54.—Photomicrograph of condyle, showing loss of major part of cartilage.

"The attached fibers of the external pterygoid muscle contain no striations (Fig. 54). Considerable amounts of loose connective tissue are present between the muscle fibers. This microscopic evidence of atrophy and degeneration is consistent with the clinical history of inability to use the mandible other than as a simple hinge joint.

"The great loss of cartilage and the active resorption and reformation of bone indicate a more extensive and active process than is usually observed in degenerative arthritis. Otherwise the changes are characteristic and diagnostic of this disease."

DISCUSSION

Osteoarthritis effects permanent changes in the joint which cause limitation of motion. The resulting ankylosis may seriously handicap the patient when eating. This condition can be relieved by excision of the condyle, or osteoarthrotomy.

VII. TUMORS AND CYSTS

Case 14

Odontogenic Cyst Associated With Tubercular Lymph Nodes

B. S. (No. 396242), a 31-year-old woman, reported to the Surgical Service on May 12, 1943, for treatment of a painless swelling of two years' duration on the left side of the neck. She also complained of lassitude, weakness, irritability, dizzy spells, and headaches, from which she had suffered during the previous month.

Two years previously, the patient first noticed a hard mass the size of a marble under the angle of the left mandible. This remained unchanged for about a year and then slowly grew larger. In April, 1943, she saw her dentist because of a toothache in the left upper and lower jaw. He found two large periapical abscesses about the second and third lower left molars and referred her to the Hospital for treatment.

The patient had been in good health all her life. There was no family history of tuberculosis, cancer, or tumor of the neck or jaw.

Physical examination showed a well-developed and well-nourished young woman in no evident distress. On the left anterolateral portion of the neck there was a swelling about the size of a walnut, firm and freely movable but not tender to touch (Fig. 55). Examination of the mouth showed a generalized ulceromembranous gingivitis. The lower left second and third molars were loose and sensitive to percussion. The temperature, pulse, and respirations were normal.

Lateral x-ray films of the jaw showed a large multilocular cystic area in the body of the left mandible beneath the first and second molars, extending through the angle of the jaw (Fig. 56). Examination of the chest was negative.

A smear taken from the gingivae revealed abundant Vincent's organisms. The white-cell count was 7,600 and the red-cell count, 4,600,000. Chemical blood studies showed 10.8 mg. of calcium per 100 c.c., 3.3 mg. of phosphorus per 100 c.c., and 2.2 units of phosphatase. Urinalysis and a blood Hinton test were negative.

On March 12, treatment was begun for Vincent's infection, which cleared up by March 29. On that date, approximately 2.5 c.c. of grayish-brown caseated material was obtained by aspiration from the cystic area. Bacteriologic examination of the material revealed abundant nonhemolytic streptococci.

The diagnosis was odontogenic cyst of the left mandible and adenopathy of the left submaxillary and cervical nodes.

On April 5, a surgical consultation was obtained in regard to the nodes in the neck, and a biopsy was advised. The biopsy was performed on April 8 by the Surgical Department. Medication consisted of $\frac{1}{6}$ grain of morphine and $\frac{1}{150}$ grain of atropine subcutaneously one hour before operation. The skin was prepared and draped in the usual manner. Under local anesthesia, a 3-cm. incision was made in the left side of the neck along the anterior border of the sternocleidomastoid muscle. A large, firm, slightly cystic, smooth node in the anterior cervical chain was dissected free and removed. The wound was closed

with interrupted silk sutures, several deep stitches being taken to obliterate the dead space. A dry sterile dressing was applied.

Pathologic examination showed tuberculous lymphadenitis.



Fig. 55.—Patient with adenopathy on left side of neck.



Fig. 56.—X-ray film of left mandible, showing odontogenic cyst.

Excision of the mandibular cyst was performed on April 13. Preoperative medication consisted of $1\frac{1}{2}$ grains of nembutal the night before the operation and in the morning, and $\frac{1}{6}$ grain of morphine and $\frac{1}{100}$ grain of atropine subcutaneously one hour before operation. Under intravenous pentothal sodium anesthesia, an incision was made intraorally along the anterior border of the ramus and continued on the horizontal ramus to the premolar region. The two molars were extracted and a large cystic cavity was opened by removing bone with rongeurs on the outer surface of the jaw. A thin cystic membrane was detached from the bone and, after being dissected away from the mandibular nerve, was removed. Inspection showed a cystic cavity measuring about 6.5 by 2.5 cm. The inner cortex of the mandible was found to be perforated. The cavity was packed with boric strips.

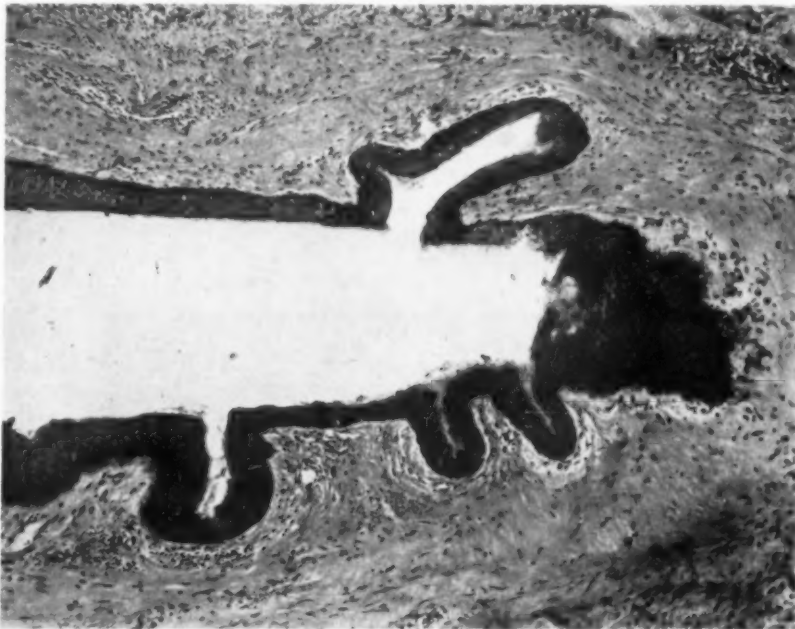


Fig. 57.—Photomicrograph showing part of cyst membrane.

Microscopic examination of the cyst (Fig. 57) showed it to be lined with stratified squamous epithelium, and its wall to be composed of fibrous and granulation tissue infiltrated with polymorphonuclear leucocytes and lymphocytes. The pathologic diagnosis was odontogenic cyst and chronic inflammation.

The fourth day after the cystectomy, the patient was well enough to be discharged to the Outpatient Department. In the Dental Clinic the cyst cavity was kept packed and irrigated until it was closed. While the patient's health has improved as a result of the removal of the cyst, there still remain other nodes in the neck, which are to be removed by the Surgical Department.

DISCUSSION

This case is one of a patient who had a large mandibular cyst with the regional lymph nodes involved. These proved to be unrelated to the jaw lesion,

however, which indicates the value of surgical consultation. The cyst probably formed from the epithelial elements of the third molar before it had erupted, and, enlarging slowly, involved a considerable area in the jaw. It may be more specifically classified as a periodontal cyst.

Case 15

Fibromatosis of the Maxillary Tuberosities

E. N. (No. 405744), a 28-year-old man, had consulted his dentist for the construction of a full upper denture. The latter referred him to this hospital for surgical treatment of what he believed to be hyperostosis of the maxillary tuberosities.

The patient had had the jaw deformity for as long as he could remember. He believed that it had grown more prominent in the last three years.

Physical examination showed that the maxillary tuberosities were enlarged to such an extent that they almost touched in the midline of the palate (Fig. 58). These masses were firm, hard, and pink, and were not tender to touch. There were five anterior teeth remaining in the upper jaw, which the patient's dentist wanted removed to facilitate the construction of a denture for the small upper jaw, so that it would occlude with the lower teeth.



Fig. 58.—Plaster model of enlarged tuberosities and resulting narrow vault.

X-ray examination showed very little deviation from normal form or density of the bony part of the maxilla. The bony tuberosity was but slightly enlarged, and this did not confirm a diagnosis of hyperostosis of the maxillary tuberosities. The deformity, therefore, must have been caused by enlargement of the mucosa covering the part (Fig. 59). The diagnosis was fibromatosis of the maxillary tuberosities.

A plastic surgical operation on the tuberosities was advised. Preoperative medication consisted of 3 grains of nembutal two hours before operation and $\frac{1}{6}$ grain of morphine and $\frac{1}{100}$ grain of atropine one hour before operation.

Under nitrous oxide-oxygen-ether anesthesia, the five remaining anterior teeth were extracted. An incision was then made over the alveolar region from the left tuberosity to the left canine region and from the right tuberosity to the right canine region. It was found that the enlargement in the tuberosities consisted of very dense fibromatous tissue, and that there was only slight hyperostosis. A wedge approximately 2 cm. wide was excised over the alveolar crest and a large part of the fibrous tissue removed by submucosal dissection. Some



Fig. 59.—Fibromatosis of gingiva with enlarged tuberosities.



Fig. 60.—Submucosal dissection of tumor.

of the projecting bone was removed with chisel and bone files. The mucosa was then approximated and fastened into place with silk sutures (Fig. 60). By this procedure the vault of the palate was enlarged to at least two or three times its former width and an alveolar process was created so that the patient could have a denture made.

The patient was discharged on the seventh postoperative day.

The pathologic examination showed the tissue to be avascular and acellular. The stratified squamous epithelium lining the tissue was thicker than normal, with the rete pegs compressed (Fig. 61). The corium was made up of coarse collagen fiber bundles (Fig. 62).



Fig. 61.—Fibromatosis. Photomicrograph shows tumor in low magnification.

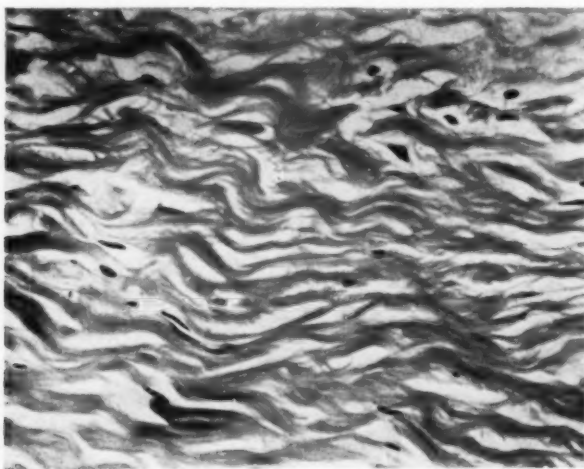


Fig. 62.—High-power photomicrograph, showing coarse collagen fibre with few fibroblasts.

DISCUSSION

Fibromatosis of the tuberosity may be unilateral but occurs in most cases as a bilateral deformity. Because the tumor is very benign, radical resection is not indicated. A submucosal resection of the fibromatous tissue generally gives satisfactory results. Although it does not remove the tumor tissue completely, it allows the construction of a denture when necessary. These tumors grow very slowly and, after reaching a certain stage, cease growing entirely; therefore, there is little danger of recurrence.

Case 16

Epulis Fibromatosa

H. V. (No. 398206), a 42-year-old woman, was admitted to the hospital on May 5, 1943, with a swelling between the right maxillary second and third molars.

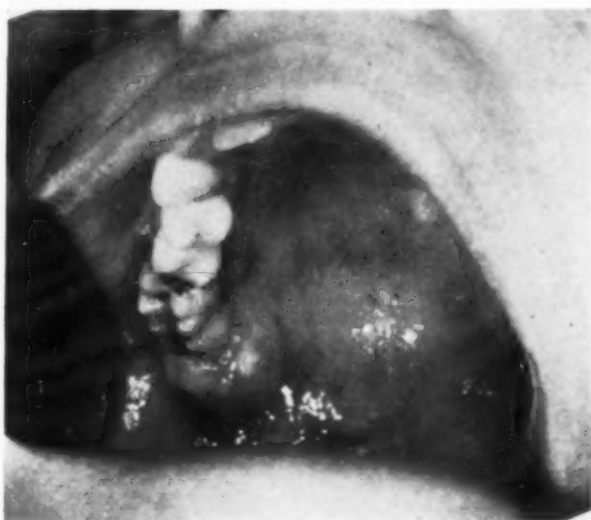


Fig. 63.—Epulis fibromatosa in posterior part of maxilla.

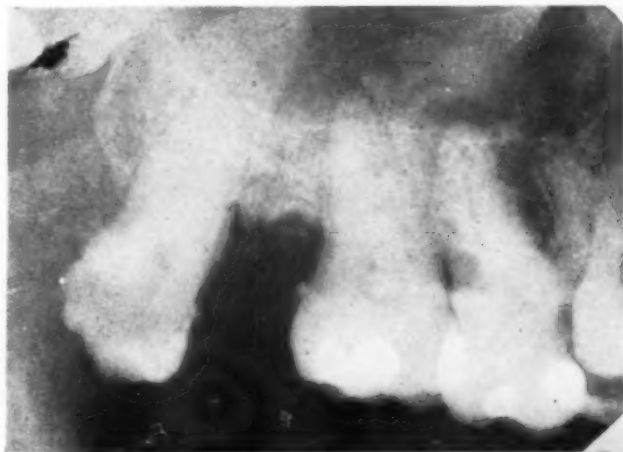


Fig. 64.—X-ray film showing epulis fibromatosa extending from between the maxillary second and third molars into the mouth.

Eight months previously, the patient had noticed a painless mass in the right upper jaw next to the second and third molars. At first she thought it might be a "gum boil," but it failed to disappear and progressively increased in size. It did not interfere with eating, nor did it bleed easily. However, it enlarged to such an extent that the teeth of the right lower jaw began to bite into it. Her dentist removed the lower teeth and referred her to the Hospital for treatment.

Physical examination showed a middle-aged woman who was healthy and normal in appearance. The tumor mass in the maxillary right second molar region (Fig. 63) was firm and pink. It was not painful to touch and did not

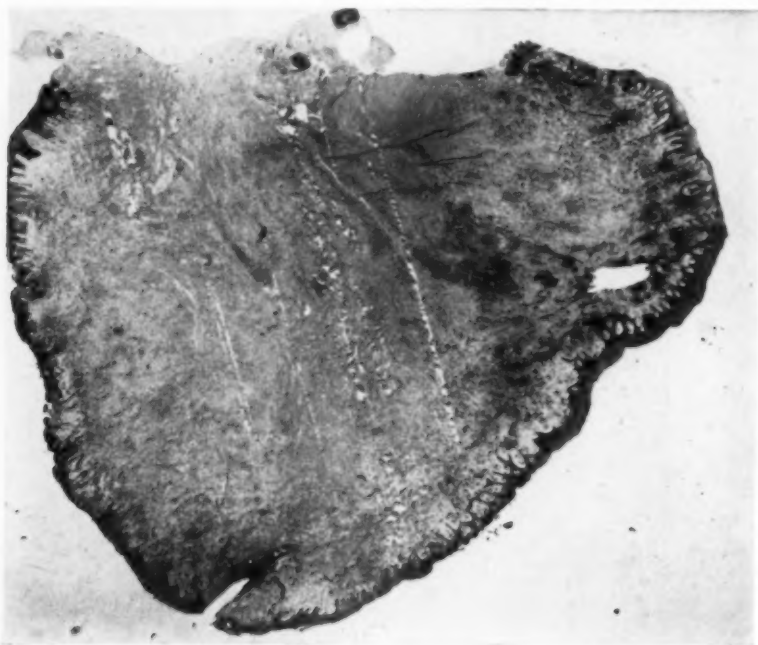


Fig. 65.—Low power photomicrograph showing section through epulis fibromatosa.

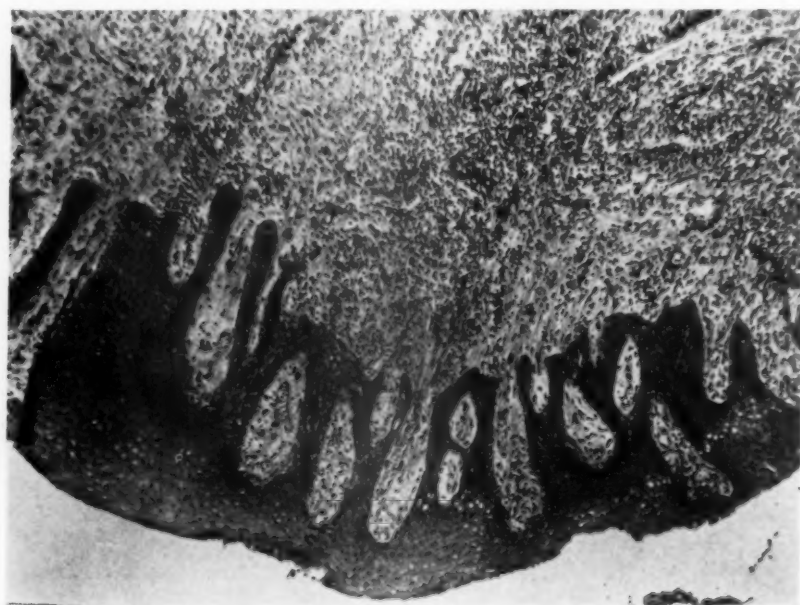


Fig. 66.—Higher magnification. Note round-cell infiltration.

blanch on digital pressure. The white-cell count was 6,300 and the red-cell count 3,800,000. Urinalysis and a blood Hinton test were negative.

X-ray examination revealed an abscess about the roots of the first molar

in the right upper jaw (Fig. 64). The crown of the third molar showed extensive destruction, and many of the other teeth needed attention. The second and third molars in the upper jaw were unusually widely separated.

A diagnosis of epulis, or possibly fibroma, was made.

It was decided to perform a diathermy excision of the tumor mass. Pre-operative medication consisted of $\frac{1}{6}$ grain of morphine and $\frac{1}{400}$ grain of atropine injected subcutaneously one hour before operation.

The operation was performed under intravenous pentothal sodium anesthesia, with a pharyngeal tube in place to help in maintaining an airway. By means of a diathermy knife, the mass was removed en bloc, including the second and third molars. The first molar was extracted afterwards. The bone was trimmed and the gingiva approximated over the defect.

The tumor measured 1.5 by 1 by 0.7 cm., and was firm and fibrous. Microscopically it was composed of fibrous tissue (Fig. 65) in which there were many lymphocytes, plasma cells, and monocytes (Fig. 66). The diagnosis was fibroma and chronic inflammation.

Recovery was uneventful. The patient was discharged on the fifth post-operative day, to be followed in the Outpatient Department.

DISCUSSION

Fibromas originate frequently in the periosteum, but may also develop from the periodontal membrane, which was apparently true in this case. The pressure from the growing tumor caused the separation of the teeth. The inflammatory reaction was probably in response to the trauma caused by the biting of the lower teeth into the tumor mass.

Case 17

Epidermoid Carcinoma of the Palate

M. R. (No. 365874), a 28-year-old man, was first seen in the Dental Clinic on July 17, 1942.

Approximately two years previously, a growth had started as a painless swelling on the palate opposite the maxillary right first molar, and had slowly spread over the palate. It had never caused discomfort in any way, and the patient came to the Hospital simply on the advice of an Army physician.

The patient was referred to the Tumor Clinic, where a biopsy showed epidermoid carcinoma, grade I. It was decided to perform an excision of the involved area, and an appointment was made for the operation. However, the patient failed to keep this appointment, and he was next seen in the Tumor Clinic nearly a year later, on June 24, 1943, having had no treatment in the interim. He had had no complaint until the middle of May, when he noticed numbness of the right side of the face. He also thought that the vision of the right eye was diminished.

Physical examination showed a well-developed and well-nourished man in some distress. The lungs were clear. No enlarged nodes were felt in the neck. The right eye was totally blind, with no sensitivity to light. Light in the left eye caused the right pupil to contract. The entire right side of the face exhibited diminished sensitivity to pain. There was ptosis of the right eyelid and

moderate right facial weakness. Examination of the mouth showed a red, granulomatous coating of the hard and soft palates, with several gray necrotic patches. The palatal roots of the molar teeth in the upper right jaw were exposed (Fig. 67). When the mouth was opened, the mandible deviated to the



Fig. 67.—Epidermoid carcinoma of palate grade I.

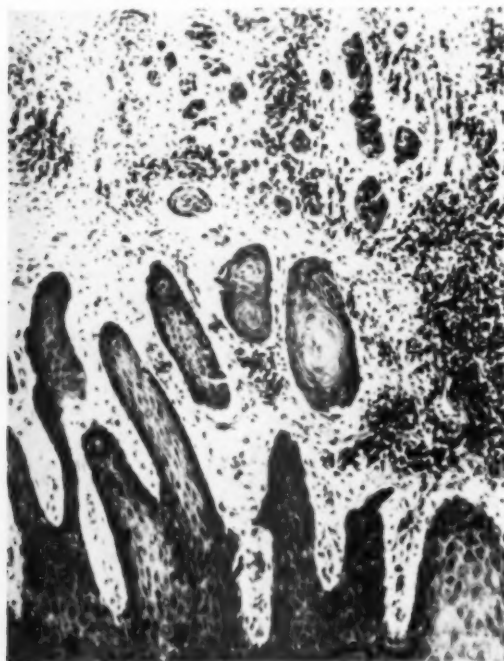


Fig. 68.—Photomicrograph showing epidermoid carcinoma grade I.

left. There was marked absence of muscle contraction on the right. On protrusion, the tongue deviated to the right. There was no evidence of lingual atrophy, and no significant speech impediment.

The white-cell count was 15,300, with 55 per cent polymorphonuclear leucocytes, 32 per cent large lymphocytes, 3 per cent small lymphocytes, 7 per cent monocytes, and 3 per cent eosinophiles. The red-cell count was 5,030,000 and the hemoglobin 80 per cent. Urinalysis and a blood Hinton test were negative.

Another biopsy showed epidermoid carcinoma, grade III. A photomicrograph of the section made is shown in Fig. 68.

The patient was seen by Dr. J. B. Ayer, who made the following comment:

"I believe that invasion of the sphenoid bone and the cavernous sinus by direct extension will be found. The ethmoid and sphenoid sinuses are probably invaded also. I cannot see how operation can help."

The patient was then examined in the Tumor Clinic, where it was decided to perform the necessary tooth extractions, preliminary to irradiation of the lesion as a palliative measure.

DISCUSSION

It was unfortunate for this patient to neglect to keep his appointment for excision of the lesion when it was small, and when there was a good chance for a cure. This is typical of many cases of this sort, and the report serves to emphasize the fact that when treatment of cancer is delayed, the prognosis becomes rapidly worse.

Case 18

Papilloma With Malignant Changes

A. R. (No. 405774), a 57-year-old man, was admitted to the Hospital on May 25, 1943, for excision of a growth on the lower right alveolar ridge.

Approximately four years previously, the patient had had several teeth extracted from the lower right jaw. After the sockets healed, a small growth appeared at the site of the extractions. This caused no discomfort. A year later, however, his dentist diagnosed the tumor as leucoplakia and advised its removal. This was done, but the growth recurred shortly afterward. During 1942 it increased in size, and while it was not painful, it prevented the patient from wearing his lower denture.

Physical examination on admission showed a patient appearing younger than the stated age and in no particular discomfort. Examination of the mouth revealed a growth about 3 by 2 cm. on the crest of the lower right alveolar ridge. Its surface was granular and slightly papillary in appearance (Fig. 69). It was painless to pressure. The adjacent sublingual tissues were inflamed. Systemic review was negative. No submaxillary, cervical or submental lymph nodes were palpable. The temperature and pulse were normal. Urinalysis and a blood Hinton test were negative.

A diagnosis of papilloma was made.

The patient was prepared for diathermy excision of the growth on May 26, the day after admission. The night before the operation, he was given 11½ grains of nembutal by mouth. One hour before the operation, ¼ grain of morphine and ¼₁₀₀ grain of atropine were injected subcutaneously.

Under pentothal sodium anesthesia, with an endotracheal tube in place, a diathermy incision was made away from tumor both inside and outside the alveolar mucosa. The tumor was detached from the bone by means of a periosteal

elevator. The resulting hemorrhage was arrested, and the mucosa of the floor of the mouth was united with the mucosa of the lip to cover the tumor bed.



Fig. 69.—Papilloma of alveolar mucosa of mandible, and leucoplakia of buccal mucosa.

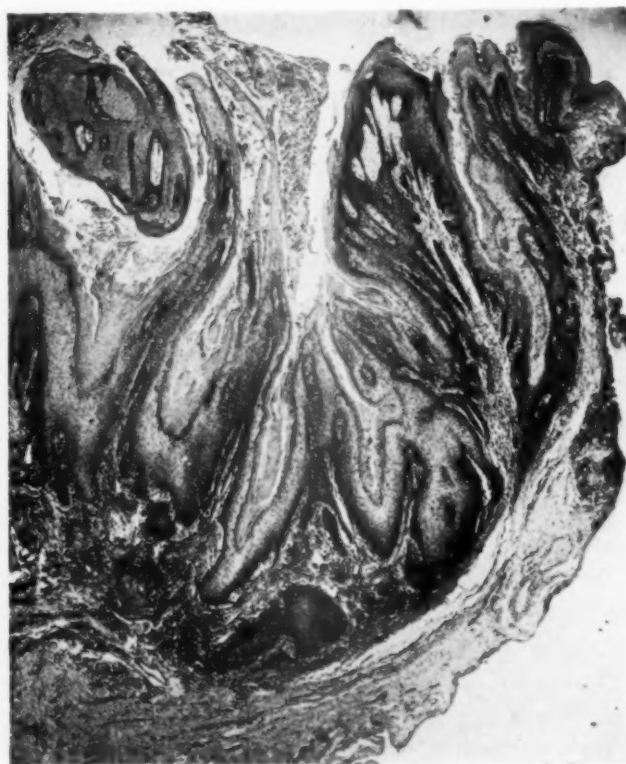


Fig. 70.—Photomicrograph of section through papilloma.

Pathologic examination showed a papillary tumor composed of stratified squamous cells. Most of the tumor could be called benign papilloma (Fig. 70),

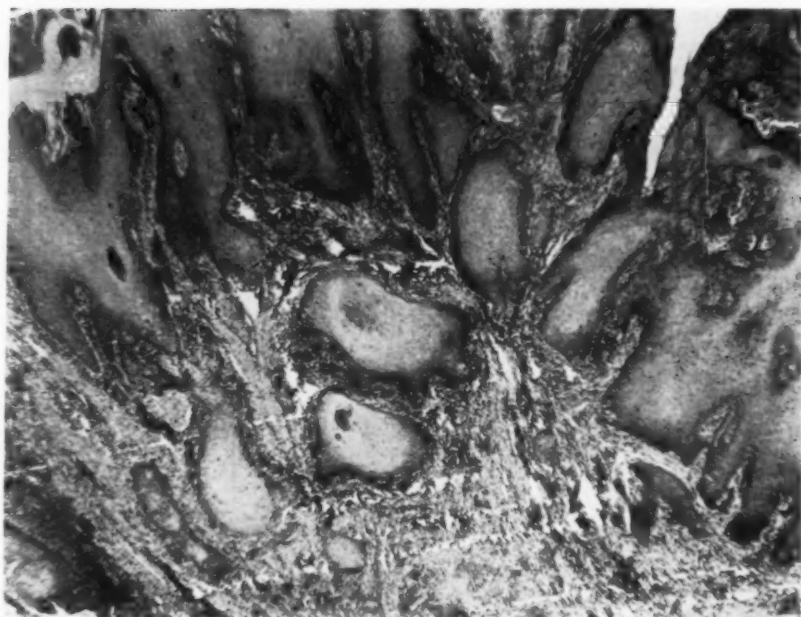


Fig. 71.—Photomicrograph showing malignant changes in papilloma. Note keratinized epithelial pearls invading downward.



Fig. 72.—Higher magnification showing section through carcinoma.

but in a few places there were keratinized epithelial pearls that had invaded downward (Figs. 71 and 72). A diagnosis of epidermoid carcinoma, grade I, was made.

After an uneventful postoperative course, the patient was discharged on May 29, or four days after admission. Subsequent checkups have revealed normal healing with no evidence of recurrence.

DISCUSSION

The history of this patient was misleading, and the finding of carcinoma could be made only by pathologic examination of the excised tissue. In such a case the entire lesion is generally excised for biopsy examination. The patient will have to be examined periodically for recurrence.

Case 19

Epidermoid Carcinoma of the Mandible

C. F. (No. 402343), a 57-year-old man, came to the Dental Clinic on April 28, 1943, with a chief complaint of soreness of the lower jaw.

One month previously, the patient had had several lower teeth extracted. The extraction sockets failed to heal, and the gingivae became greatly swollen. An extremely painful sore developed on the right sublingual tissue. He therefore returned to the dentist, who told him to get "some tablets" to dissolve in water and use as a mouth wash. This treatment resulted in no improvement, and the patient therefore reported to the Hospital.

Physical examination showed a moderately well-developed and well-nourished man, appearing older than the stated age. Examination of the mouth revealed poor hygienic condition. The breath was foul. The lower right incisor and first premolar teeth had been extracted, and the sockets were unhealed. The surrounding gingival tissue and the right sublingual tissue were swollen and deeply fissured, and of a cauliflower-like texture (Fig. 73). The right anterior two-thirds of the tongue was deeply indurated and extremely painful to touch. The right submaxillary and submental lymph nodes were enlarged and firm. The temperature and pulse were normal.

Roentgenologic examination revealed a defect in the anterior portion of the inferior alveolar process, extending from the right incisor laterally for about 2 cm. The suggestion was made that this might be due to infection rather than to destruction by malignancy. However, a biopsy was performed, and pathologic examination showed an epidermoid carcinoma, grade III (Fig. 74).

On May 4, the patient was presented at a Tumor Clinic conference, where it was decided that surgical treatment would be unwise, and that radiation should be instituted after removal of the remaining lower teeth. For this treatment, the patient was referred to the Tumor Clinic.

A month elapsed between the patient's visits, and when he was re-examined on June 7, the lesion had extended into the buccal sulcus. Enlarged lymph nodes were palpable in both submaxillary areas.

The teeth were immediately extracted under novocain block. Irradiation was started the same day and continued for three weeks, a total of 2,100 roent-

gen units being given to each side. On June 29, the treatment was stopped because of severe purulent mucositis, which made swallowing painful and breathing difficult. There was a dusky, red-black, nonulcerated irradiation area on both skin fields. The patient was told to use saline mouth washes and chlorophyll ointment and to return in two weeks for possible further treatment.

On July 6, the patient complained of severe pain in the mouth. The irradiation reaction on the skin had decreased considerably. There was still a heaped-up, fungating lesion in the floor of the mouth, but this had become smaller. The lesion on the tongue had disappeared, being replaced by ulcerated yellowish necrotic areas. The nodes in the submaxillary region were noticeably decreased.

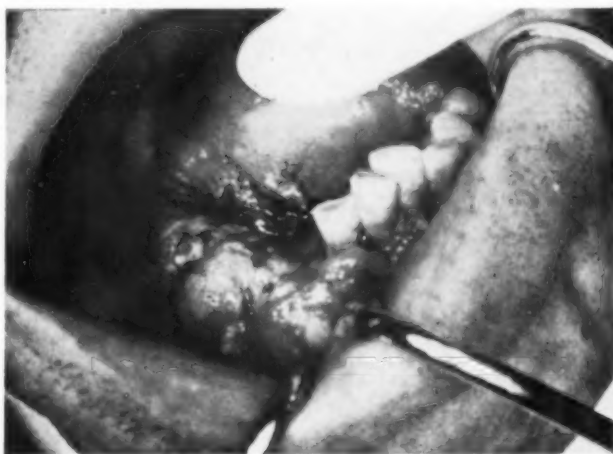


Fig. 73.—Epidermoid carcinoma of mandibular mucosa.

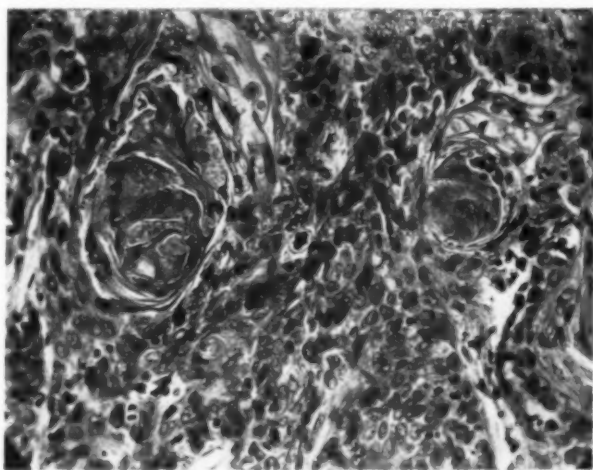


Fig. 74.—Photomicrograph showing epidermoid carcinoma grade III.

On July 20, the patient showed a marked improvement both psychologically and physically. The pain had ceased. He was able to eat and drink without discomfort, and was eager to return to work. The skin reaction had disappeared. The original tumor had also disappeared, leaving a large crater on the right side of the floor of the mouth. No adenopathy of the cervical lymph nodes was felt.

It was decided at this time to keep the patient under observation and to treat recurrent lesions as they appeared, rather than to give further radiation at once, thereby conditioning the skin against further energetic treatment.

DISCUSSION

This is another case of far-advanced carcinoma of the mouth which was not recognized. Dentists frequently see patients with oral cancer; they should be able to recognize or at least suspect the presence of malignant disease, and should refer such patients promptly for biopsy and treatment, without experimental treatment, be it extraction of teeth or the giving of medicine.

Case 20

Adenocarcinoma of the Mandible

L. P. (No. 281274), a 42-year-old man, was admitted to the Hospital on March 24, 1943, for excision of a recurrent adenocarcinoma of the maxilla.

The patient was first seen in the Dental Clinic in December, 1940, complaining of a swelling of the upper jaw and cheek of one month's duration. In the previous month he had had two upper left teeth extracted. His dentist then noticed a mass on the hard palate next to the extraction sockets. This was incised, but no pus was found. The dentist diagnosed the mass as a cyst and referred the patient to the Hospital for treatment.

Examination of the mouth at that time showed a large smooth mass involving the whole left side of the maxilla. No lymph nodes were palpable in the neck. X-ray films showed a smooth mass in the left maxillary sinus with complete destruction of the posterior part of the sinus. An effort was made to enucleate the whole mass. When the area was exposed, however, the mass was found to be much more extensive than the clinical and x-ray examinations had indicated.

The portion of the mass which had been removed was sent to the pathologic laboratory and a diagnosis of adenocarcinoma was made. The pathologist commented as follows:

"If this tumor arose in the oral cavity, it is probably a variant of a mixed tumor, and it does, in fact, resemble grossly the epithelial elements of certain mixed tumors. The presence of a small fragment of ciliated antral mucosa suggests another possibility: that the tumor was primary in the antrum and invaded the oral cavity secondarily. It is definitely malignant, and mitotic figures are not infrequent, but the uniformity in size of the nuclei and the high degree of gland formation suggest a relatively low grade of malignancy."

The patient was examined in the Tumor Clinic on Jan. 23, 1941, where immediate admission to the Eye and Ear Infirmary for complete excision of the mass by external operation was advised.

The patient, however, refused to permit the operation until four and one-half months later. He was admitted to the Eye and Ear Infirmary on June 11, 1941.

Regional examination showed fullness on the floor of the nose and on the left lateral nasal wall. The soft and hard palates and the upper molar region

on that side were spongy. The maxillary premolars were loose. No lymph nodes were palpable in the neck.

Resection of the left maxilla with electrocautery was advised. Under nitrous oxide-oxygen-ether anesthesia, the antral tumor, the hard palate, and the alveolar process were removed en bloc. The soft palate was left in place. There appeared to be some growth extending back into the pterygopalatine and maxillary fossae, but this was not accessible. A large sponge soaked in tincture of benzoin was inserted in the defect and anchored through the right nares.

On July 9, or four weeks after admission, the patient was discharged from the Eye and Ear Infirmary and referred to the Dental Clinic for prosthesis. A denture was constructed which proved entirely satisfactory, enabling the patient to chew properly and causing him little discomfort.

The patient came in for periodical examination. During the ensuing ten months, he gained 20 pounds and had no complaints whatever. The appearance of the mouth at this time is shown in Fig. 75. On March 19, 1942, when the patient was seen in the Tumor Clinic, a suspicious area was noticed on the posterior part of the antral cavity. A biopsy was taken of this tissue, and the pathologic diagnosis was again recurrent adenocarcinoma. The patient was readmitted to the Eye and Ear Infirmary, where, under local anesthesia, the mass was burned away by means of diathermy. The patient was discharged the same day to be followed in the Tumor Clinic. He was examined every two months until March 4, 1943, or nearly a year later. There was no evidence of recurrence of the tumor in the meantime, and the denture had remained satisfactory. He was therefore told to report in six months instead of the usual two.

However, on March 18, 1943, the patient came to the Dental Clinic to have the denture adjusted, as it seemed to be impinging on the tissues of the mucolabial fold. Examination revealed a spongy, indurated mass of tissue along the remaining portion of the anterior alveolus of the maxilla, extending forward into the mucolabial fold and back into the soft palate (Fig. 76). No lymph nodes were palpable in the submaxillary or cervical region. The mass was diagnosed as a recurrence of adenocarcinoma and the patient was admitted to the Hospital for diathermy excision.

One hour before operation the patient was given a subcutaneous injection of $\frac{1}{6}$ grain of morphine and $\frac{1}{100}$ grain of atropine. Under intravenous pentothal sodium anesthesia, the tumor was exposed in the anterior part of the maxilla and was removed by incision with an endothermy knife in the periphery of the tumor, including the base of the lip, the greatly thickened alveolar mucosa, and the anterior part of the hard palate. The tumor seemed encapsulated, and extended from approximately the right maxillary molar region to the perforation on the left side where the primary excision had been made. The bone was separated on the right side with a chisel. The palatine artery was ligated and the entire anterior maxilla, including three teeth, was removed en bloc. Various bleeding points were coagulated, and a vaseline borie strip was inserted in the maxillary sinus on the right. Another was put over the tumor bed and held in place by means of silk sutures carried over it from one edge of the wound to the other.

An x-ray film of the excised part of the maxilla showed almost complete destruction of the bone (Fig. 77). Microscopic examination again revealed adenocarcinoma (Fig. 78). With higher magnification, numerous mitotic figures could be seen (Fig. 79).

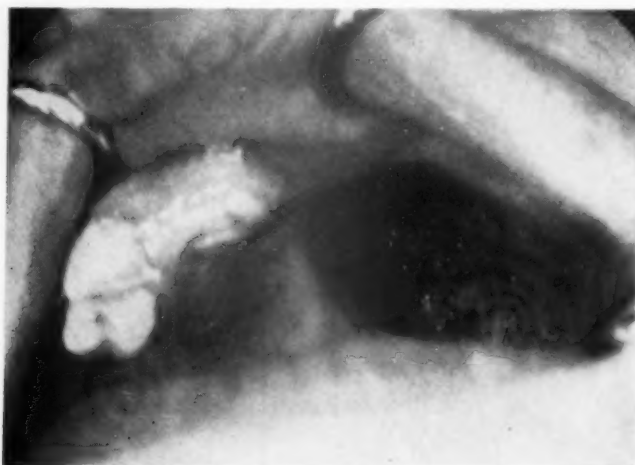


Fig. 75.—Photograph after first excision of adenocarcinoma.



Fig. 76.—Photograph showing recurrence of adenocarcinoma.

Recovery was uneventful and healing was satisfactory. The patient was discharged on March 29, the fourth postoperative day. The old denture could no longer be used, however, and he was readmitted on July 1 for plastic closure of the perforation of the left antrum and revision of the defect preparatory to further prosthesis. This operation was performed on July 2, and the patient was discharged on July 6. Subsequent checkups in the Dental and Tumor Clinics have revealed no evidence of recurrence of the tumor, and prosthesis to repair the operative defect will be carried out as soon as possible.

DISCUSSION

The palate is a favored location for adenocarcinoma. The tumor is generally a slow-growing one which does not easily cause metastasis, but being of



Fig. 77.—X-ray film of excised specimen.

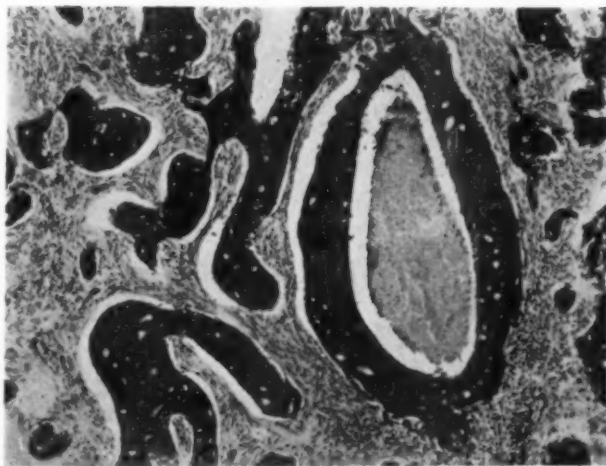


Fig. 78.—Low-power photomicrograph showing adenocarcinoma.

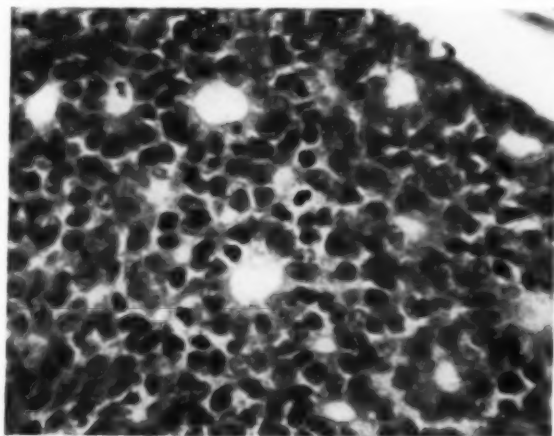


Fig. 79.—High-power photomicrograph of adenocarcinoma. Note mitotic figures.

invasive character it extends peripherally and is therefore difficult to excise completely.

This case illustrates a frequent occurrence. The patient was unwilling to have a radical operation at the time when such a procedure would have given the best results. At later operation, the prognosis had become much more unfavorable. It is questionable whether the patient has been cured by the procedure described. Probably there will be further recurrence later on.

VIII. DISEASES OF THE SALIVARY GLANDS

Case 21

Sublingual Abscess Caused by Calculus in the Sublingual Gland

F. W. (No. 398098), a 63-year-old man, entered the Emergency Ward on April 8, 1943, complaining of pain and swelling underneath the left side of the tongue.

Two years previously, the patient had had a similar involvement in the same region. He was about to obtain medical advice when he passed a stone the size of an olive pit from the right submaxillary duct. The swelling immediately subsided, and the pain was relieved. Three weeks before admission the patient noticed a recurrent swelling at the same site, which pushed the tongue upward and back until it was almost impossible for him to swallow or talk. His dentist referred him to this hospital. Shortly before entry a large amount of pus was expressed spontaneously from an opening underneath the left side of the tongue. This made him feel somewhat better and permitted him to talk and swallow with only moderate discomfort.

For the past fifteen months, the patient had had mild diabetes mellitus, which was controlled by diet.

Physical examination showed an elderly man in considerable distress. There was a tender, indurated swelling of the left submaxillary area. Neither submaxillary nor cervical lymph nodes were palpable. The jaws were edentulous. There was an angry, extremely tender, edematous swelling in the left sublingual area. The tongue was also edematous, and was forced upward and backward (Fig. 80). Slight pressure on the mass resulted in discharge of pus from a fistula. Salivation was excessive. The temperature was 102.5° F., the pulse rate 100, and the respiratory rate 30. The white-cell count was 7,200. The hemoglobin was 90 per cent. Urinalysis and a blood Hinton test were negative.

X-ray examination showed a triangular area of calcification with a side length of about 1 cm. It was located approximately in the first molar region of the left mandible (Fig. 81).

The diagnosis was calculus in the left sublingual gland.

It was decided to incise and drain the swelling and remove the calculus. In an effort to localize the swelling, the patient was given hot saline mouth washes, 2 Gm. of sulfadiazine at once and 1 Gm. every six hours thereafter, and 4 drams of sodium citrate twice a day. Morphine ($\frac{1}{6}$ grain every three hours) was used to control the pain. Three days after admission a sulfadiazine blood level of 6.2 mg. per 100 c.c. had been reached, and the patient was prepared for surgical treatment. Shortly before the operation was to take place, however, an

intern was massaging the left sublingual tissues when a Y-shaped stone about the size of a pea was expressed from the fistula. Almost immediately there was a dramatic subsidence of the symptoms. The operation was canceled, sulfadiazine was discontinued, and the patient was discharged the following day, to be followed in the Outpatient Department. One week later there were no symptoms whatever and the patient was discharged as cured.



Fig. 80.—Photograph showing sublingual abscess and edema of tongue due to salivary calculus.



Fig. 81.—Salivary calculus and sublingual abscess.

DISCUSSION

Differentiation between stones in the sublingual glands and those in the submaxillary duct can frequently be made from their roentgenologic appearance. If long and narrow, or oval, the stone is generally located in the duct. If round, or, especially, if irregular in shape, it is most often found in the sublingual glands.

Case 22

Calculus in Submaxillary Gland

R. N. (No. 207586), a 50-year-old man, came to the Surgical Clinic on May 17, 1943, complaining of intermittent swelling in the right submaxillary region of four weeks' duration.

Approximately four weeks previously, while eating breakfast, the patient noticed a firm swelling as large as a walnut in the right submaxillary region. The swelling enlarged and subsided about twenty times during the meal. This recurred at all following mealtimes, subsiding about a half-hour after eating. At one time the swelling grew to the size of a tennis ball. There were no symptoms between meals, except that on one occasion, about a week after the onset, he noticed a "hole" beneath his tongue on the right side, from which a drop of pus was discharged.

The patient had been under treatment for acute coronary occlusion since 1939.

Physical examination showed a well-developed and well-nourished man in no distress. The mouth could be opened to normal width. The openings of Wharton's ducts appeared normal, and there was no mass externally palpable in the submaxillary region at the time of examination. However, with one finger in the mouth and one beneath the angle of the mandible, a definite swelling about the size of an olive could be felt on the right side. This was painful to pressure. The white-cell count was 12,500. Urinalysis and a blood Hinton test were negative. The temperature and pulse were normal.

The report of the Radiological Department was as follows:

"Examination of the right submaxillary region reveals a round area of increased density 2 mm. in diameter which probably represents a calculus in the right submaxillary duct." (Fig. 82.)

The case was referred to Dr. David Weisberger for evaluation and treatment. One week later lipiodol was injected into the right submaxillary gland and a sialogram was taken of the right submaxillary area. The film (Fig. 83) showed the opacity previously described to lie along the course of the submaxillary duct, obstructing it. Comparison of the x-ray films with the sialogram confirmed without question the impression that the right submaxillary duct was obstructed by a calculus.

The patient was admitted to the main hospital on June 5 for intraoral incision and removal of the stone. The use of novocain rather than general anesthesia was advised because of the patient's cardiac condition. Preoperative medication consisted of $\frac{1}{6}$ grain of morphine and $\frac{1}{150}$ grain of atropine subcutaneously one hour before the operation. No food was given by mouth after midnight the night before the operation.

At operation novocain was infiltrated in the floor of the mouth, and a probe was passed into the right submaxillary duct. The mucosa over the probe was incised. The inner aspect of the duct was exposed but the stone could not be found there. However, in the posterior portion of the duct, at its exit from within the gland, a small firm stone could be palpated. It was not freely movable and apparently was within the gland substance. After several unsuc-



Fig. 82.—X-ray film of right submaxillary region. Arrow points to small salivary calculus.

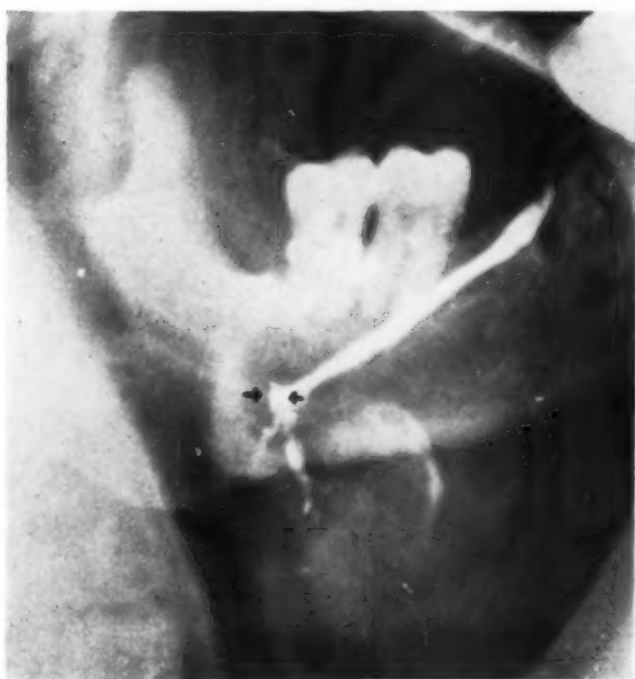


Fig. 83.—Sialogram. Arrows point to calculus obstructing submaxillary duct.

cessful attempts to remove the calculus, it was decided to do nothing further at this time. The wound was left open and the patient was sent back to the ward.

On the first postoperative day, at breakfast, the gland swelled up as it had done originally. Emergency x-ray films showed the stone to be still in place.

Because of the heart involvement, it was thought that further surgical treatment should be avoided if possible. Consultation was sought with the Radiological Department, where the following opinion was expressed:

"The likelihood that the stone will be expelled from the gland into the duct where it could be surgically approached seems rather small. The patient has had one coronary attack and his expectancy may not be too great. Accordingly, it is felt that a trial of radiation to produce some cessation of secretion of the obstructed gland is justifiable. The patient would probably get some increase in the edema and discomfort during the first few days. I do not believe we can be entirely certain that salivation will permanently cease."

It was decided that the suggested irradiation should be applied, and that if the symptoms did not subside a week after completion of treatment, an external excision of the salivary gland should be carried out.

At the end of the week, when the acute edema had subsided, the symptoms were essentially the same. Therefore, on June 22, the patient was readmitted for excision of the gland. The same preoperative medication was administered as for the previous operation.

At operation, the skin was prepared with soap and water and iodine. Under local infiltration anesthesia with 1 per cent novocain, a 7-cm. incision was made 3 cm. below and parallel to the horizontal ramus of the mandible directly over the submaxillary gland. This was carried down through the superficial fascia, the platysma, and the deep fascia, and the outer surface of the gland was exposed. With sharp and blunt dissection the gland was carefully freed from its surrounding fascial envelope. The gland was found to be adherent in its anteromedial pole to the posterolateral surface of the mylohyoid muscle, presumably the site of the stone and the region of the previous manipulation. The external maxillary artery was found to be intimately associated with the posterior surface of the gland. This was dissected free without damaging the vessels (Fig. 84). The gland was totally freed, a double ligature was passed around the projection of the gland leading upward along the duct, and the gland was excised. The stump was closed with an over-and-over cotton suture. At the conclusion of the operation, the wound was totally dry. Interrupted cotton sutures were used to close the deep fascia and platysma, and all air was expelled from the cavity that remained. The patient was allowed to flex his neck. The subcutaneous tissues were closed with interrupted cotton and the skin with interrupted silk sutures.

Pathologic examination of the gland showed chronic inflammation (Fig. 85).

On the first postoperative day the temperature rose to 100° F. and the patient complained of pain over the region of the wound. These symptoms continued for one week. Since this indicated infection, the wound was opened. Ten cubic centimeters of mucopurulent fluid drained from it. A pack was inserted. The patient was discharged on July 6, with the wound still packed

and draining, to be followed in the Surgical Clinic. At the time of writing, the patient was still under treatment, though the infection and drainage have almost completely subsided.

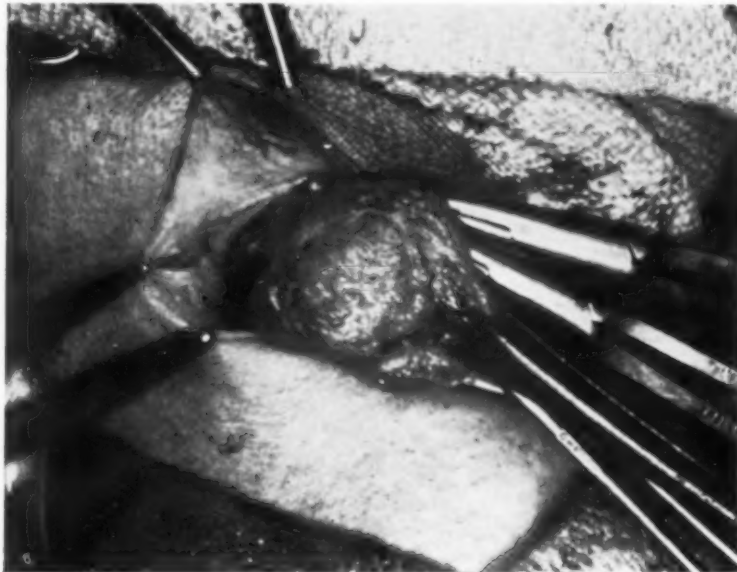


Fig. 84.—Excision of salivary gland.

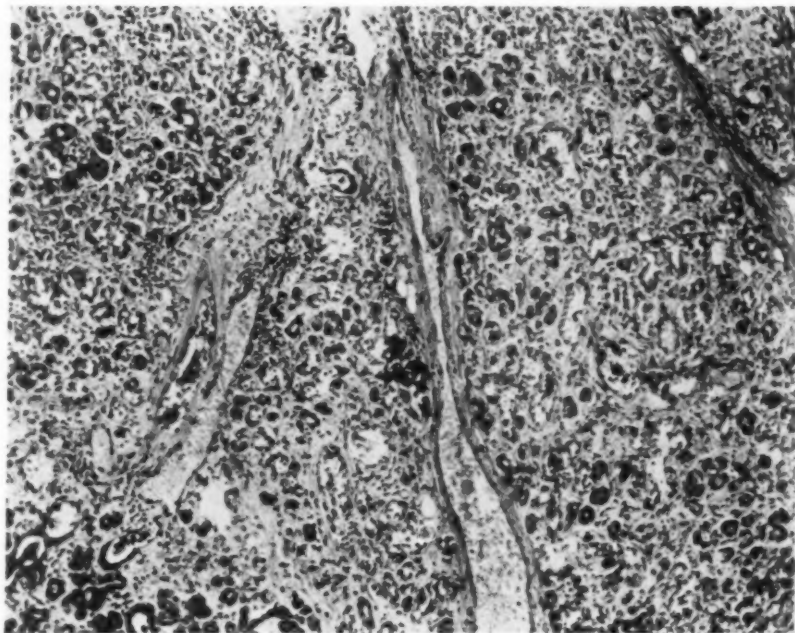


Fig. 85.—Photomicrograph of submaxillary gland, showing chronic inflammation.

DISCUSSION

The development of the "hole" under the tongue one week after onset was probably due to erosion of the duct by a large stone. The continued obstructive symptoms were caused either by a small remaining fragment or

an isolated sialolith within the hilus of the gland. Although it seemed possible to reach the point of obstruction through an intraoral approach, some doubt existed because of the position of the obstruction revealed by the sialogram. The failure to remove the obstruction at the first operation was apparently due to fibrosis associated with it. A question arose at this point relative to the advisability of immediate external excision of the gland. Because of the heart condition, it was decided to postpone further procedure. The recurrence of the swelling one day postoperatively at mealtime proved that the obstruction was persisting.

Radiation was thought to be the advisable treatment at this time. However, there was little success in stopping the secretion. The submaxillary glands do not respond as well to radiation as do the parotid glands.

IX. SURGICAL PROSTHESIS

Case 23

Cranial Prosthesis

L. W. (No. 310180), a 32-year-old man, was admitted to the Neurosurgical Service for repair of a cranial defect.

The patient had been well until five years previously, when he received a moderately severe head injury, after which he began to have frequent severe headaches, lasting about half an hour and localized over the temporoparietal region. X-ray films of the skull taken at another hospital showed a calcified mass deep in the temporal region to the left of the midline. During an operation considerable difficulty was encountered due to the marked increase in the intracranial pressure. Cannular explorations were unsuccessful in reaching the tumor, and because of the increased pressure, a bone flap had to be removed in order to effect closure. The patient was discharged unimproved.

Physical examination showed a depression in the left temporoparietal region measuring approximately 11 by 9 cm. (Fig. 86). A roentgenologic view of the defect is shown in Fig. 87. The area was tender to the slightest pressure.

It was decided to repair the cranial defect in order to protect the underlying tissue. The Dental Service was consulted for the purpose of constructing a metal plate for anatomic restoration of the skull.

The head was shaved and a plaster head cap constructed to be used as a tray to hold the impression material. Hydrocolloid was used to take an impression of the whole skull. A stone model was poured, and the contour of the defect was restored in wax on the model. Another impression was then taken of the restored area, and metal male and female dies were made of that portion containing the defect. A piece of tantalum plate was beaten in shape and trimmed to overlap the bone margins.

Under local anesthesia, the neurosurgeon turned down the old scalp flap and incised the periosteum at the edge of the skull defect. The thin layer of periosteum was turned back and freed from the edge of the skull (Fig. 88). A series of drill holes were placed in the dome around the edge of the defect.



Fig. 86.—Photograph of cranial defect, showing depression of left temporoparietal region.

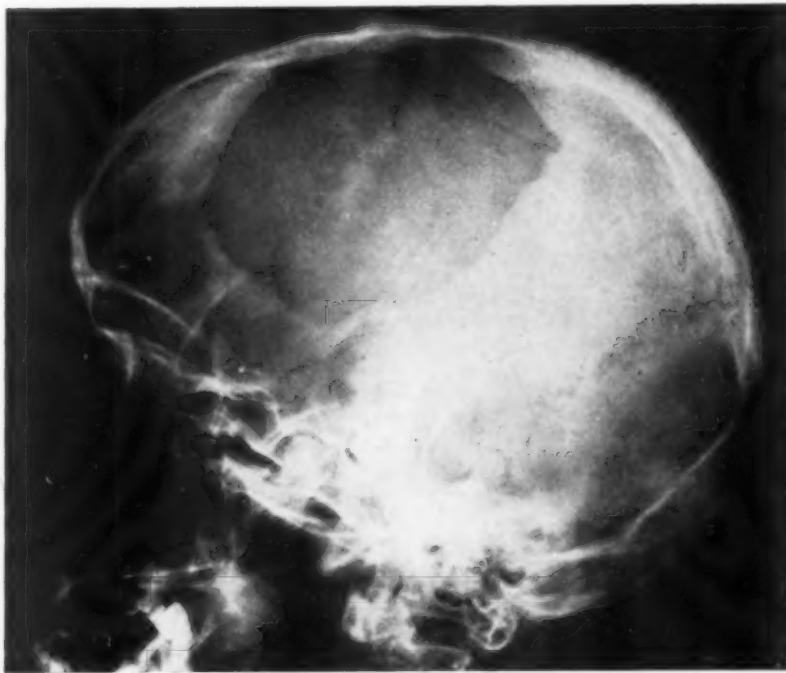


Fig. 87.—X-ray film showing depression of left temporoparietal region.



Fig. 88.—Photograph showing scalp flap.



Fig. 89.—Photograph showing tantalum plate attached to bone.



Fig. 90.—Normal contour of skull restored as result of operation.



Fig. 91.—Postoperative x-ray film.

The tantalum plate was then drilled at corresponding points and dropped into position, being held by double Deknatel sutures of $\frac{3}{1000}$ -inch tantalum wire (Fig. 89). The galea and scalp were carefully sutured in position in two layers.

Fig. 90 shows the patient one week after operation, with the contour of the skull restored. A roentgenogram taken after the operation is shown in Fig. 91.

DISCUSSION

This case is presented to show how the dental service of a hospital can be of use to other departments. Similar metal plates are used to cover defects caused by osteomyelitis of the frontal bone.

Editorial

The Publication of Oral Surgical Case Reports From Teaching Hospitals

In this issue of the Oral Surgery Section of the JOURNAL we present the Massachusetts General Hospital number. This is an innovation that we hope our readers will approve. So many times the head of a clinic is asked, "May I come and spend some time with you?" or "May I attend some of your staff conferences?" that your editor thought it would be valuable to devote a few issues during the year to the description and discussion of interesting cases treated at the teaching hospitals of America. To make a start with this enterprise, the editor has chosen to devote the October issue to his own clinic, presenting some of the outstanding cases treated at the Massachusetts General Hospital during the last six months.

A cordial invitation is herewith extended to the heads of other oral surgical clinics to participate in this new venture by making available to the readers of the JOURNAL in a similar manner their own valuable teaching material. This is an opportunity to present cases of special diagnostic interest, or cases that required unusual methods of treatment because of local complications, or made the cooperation of other departments of the hospital necessary because of somatic involvement. The publication of the proceedings of hospital clinics furthermore gives an opportunity to make known what particular procedures and methods have been found by the various groups to be the best for routine cases.

The oral surgeon deals with a great variety of diseases: malformations, traumatic injuries, orthopedic conditions, infections of the soft tissue, the teeth, or the bones, and tumors of a large variety. In most hospitals the treatments of these defects is somewhat influenced by the attitude and policies of related departments in the treatment of similar diseases in other parts of the body. In the Massachusetts General Hospital all osteomyelitis cases are presented at osteomyelitis rounds, fractured jaws at the fracture conferences, and tumors of the mouth at the Tumor Clinic. This makes for a healthy intercourse between departments, from which one can profit greatly, especially in regard to the general care of the patient. Also, there is no doubt that in some centers, more cases of one type are seen than of others, and such clinics may therefore be able to make a contribution by giving others the benefit of their experience.

Many of the cases presented in the contemplated "Clinic numbers" probably will have been discussed at the dental or oral surgical conferences, which, according to the new regulations proposed by the American College of Surgeons

in their "New Minimum Standard for Dental Departments in Hospitals,"^{*} should be held regularly at all Class A hospitals. It would be helpful if such discussions were added to the case reports. Although these discussions are primarily held for the benefit of the staff and the attending students, they are of equal value to the readers of the JOURNAL. If published therein as verbatim statements by the members of the hospital staff, or as summaries of discussions, they will greatly enhance the value of the clinic.

K. H. T.

53 BAY STATE ROAD

^{*}AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY 29: 344, 1943.



YOU CAN DEPEND ON THESE FINE ORTHODONTIC MATERIALS AND SUPPLIES

SPECIAL ATTENTION:

We would like to point out the features of MULTI-ORTHO wire in particular. It is extremely economical yet it has unusual qualities that are ideally suited to orthodontic application.

Multi-Ortho platinum color wire is a completely temperable, high-fusing, platinum-gold arch wire. It has a unique ability to accept bends of the most intricate pattern—it takes any grade of solder—it handles easily.

Multi-Ortho wire is so light that you receive approximately 20% more wire per dwt. For example: A foot length of (.040) 18 gauge wire weighs only 2 dwt. so that its actual linear cost is only \$3.26 per foot.

If your dealer doesn't stock Multi-Ortho Wire, you may order directly from us. Shipment will be made by return mail.
\$1.63 dwt.

JULIUS ADERER, INC.

Manufacturers of Precious Metal Alloys for Dentistry

115 West 45 Street, New York City

•

55 E. Washington Street, Chicago

Just Issued**New 5th Edition**

EXODONTIA

Exodontia, Oral Surgery and Anesthesia


By **LEO WINTER, D.D.S., M.D., F.A.C.D., F.A.C.S., Sc.D. (Hon.), LL.D.**

Professor of Oral Surgery, New York University; Director of the Oral and Minor Surgery Clinic, New York University College of Dentistry; Visiting Oral Surgeon in Charge, Bellevue Hospital; Consulting Oral Surgeon, Montefiore Hospital; Chief of Dental Clinic, New York University College of Medicine; Fellow New York Academy of Medicine.

576 pages, 6¾ x 9¾, with 485 text illustrations and 7 color plates. Price, cloth, \$10.00.

THIS book, popular in previous editions, has been enlarged and completely revised with many new and original cuts. In illustrating the sections on *Local Anesthesia* the author has used drawings in full colors from original laboratory specimens to show all the structures through which the needle passes in reaching the mandibular and maxillary nerve trunks. A complete fully illustrated section on *General Anesthesia for Ambulatory Dental Patients* by Dr. Anthony S. Mecca is an important feature. A new chapter on Chemotherapy is included.

ONE of the outstanding features is the fact that all operations for the *extraction of teeth* are fully illustrated step by step. Other important subjects skillfully treated are Bleeding, Surgical Preparation of Mouth for Dental Prosthesis, Impacted Teeth, Infections and Cysts.

 Every Surgeon will want to have this outstanding publication for reference. Send for your copy today.

The C. V. Mosby Company
3525 Pine Boulevard
St. Louis, Missouri

MJ

Gentlemen: Send me a copy of the NEW 5th EDITION of WINTER on EXODONTIA. Price, \$10.00.

-----Attached is my check.

-----Charge my account.

Dr. -----

Address -----

